



**HIGH-PERFORMANCE  
SEALED BRUSHLESS  
MOTOR FANS & BLOWERS**

**12V - 24V dc/cc**





We always strive to perform at the highest standards possible. We believe that quality, innovation and service are cornerstones that guide our culture while building our legacy. On these cornerstones SPAL has earned its reliability over the years, becoming an ideal partner to design, manufacture and market ventilation solutions in an expanding array of applications.

*Alessandro Spaggiari*



## The SPAL Strengths

### TECHNICAL KNOWLEDGE

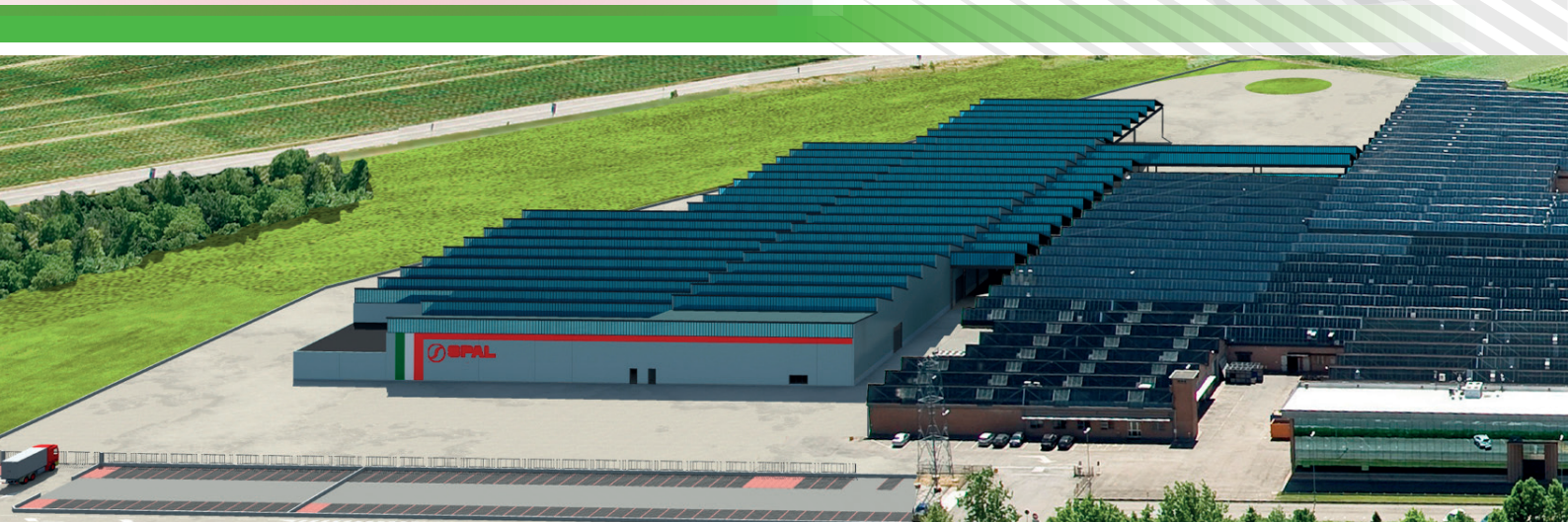
- Fluid-dynamics
- Thermodynamics
- Electronics
- Electro-magnetic
- Mechanical

### IN-HOUSE TESTING AND VALIDATION EQUIPMENT

- Climatic chambers
- Thermal shock chamber
- Oven & hot test chambers
- Water & salt spray chamber
- Vibration test benches
- Vibration test bench in climatic chamber
- Airflow test chambers
- Anechoic chamber with spectrum analyzer
- Endurance test facility
- Motor torque test bench
- 3D tester
- Laser sintered prototype machine
- EMC test equipment

### FULLY INTEGRATED PROCESSES

- Rapid prototyping
- Chemical Department
- Tool shop
- Moulding
- Motor design and production
- PCB In-house Production
- Electronics SMD
- Automated assembly process





The SPAL production facility in Correggio, Italy, extends an area of 66,000 m<sup>2</sup> hosting over 800 employees from research & development, and manufacturing departments.



# INDEX

The fan models are listed by decreasing fan diameter, and within the same diameter, in decreasing power rate.

**It is customer's responsibility to verify that the selected product and/or the one we suggest from our catalogue suits the technical requirements and working conditions according to customer's application.**

12V

	Ø	Shroud	page
Axial	405 mm (16")	VA117 VA97	10 12
Axial	385 mm (15.2")	VA91	14
Axial	355 mm (14")	VA116	16
Axial	305 mm (12")	VA90 VA89	20 22
Axial	280 mm (11")	VA99	24
Axial	255 mm (10")	VA109	26
Centrifugal	020	020	28

General Warranty Conditions	page	6
Recommendations for use of Axial and Centrifugal Blower	page	7

# INDEX

In case you are unable to find a suitable fan for your application, please contact us and we will help you find the best solution for your specific requirements. Upon request, we will support you in co-designing and developing new products and solutions.

**Our technical specification are purely indicative and might change without any previous notice.**



	Ø	Shroud	page
Axial	405 mm (16")	VA97	32
Axial	355 mm (14")	VA116	34
Axial	305 mm (12")	VA113 VA90 VA89	36 38 40
Axial	280 mm (11")	VA99	44
Axial	255 mm (10")	VA109	46
Centrifugal	020	020	48
Single wheel blower without housing			50

DRIVE CONTROL MODES	page	54
ACCESSORIES	page	62

# General Warranty Conditions

All SPAL fan/blower modules are GUARANTEED free from defects FOR 36 MONTHS.

Validity of the Warranty remains subject to the following conditions:

- 1) WARRANTY expires 36 months after the shipment date from SPAL Automotive.
- 2) the main label on the product (with indication Q.C. - Quality Control) must remain stuck to validate the warranty (the WO number - Work Order of production - is a SPAL internal increasing number which allows SPAL to trace the production lot details);
- 3) warranty is valid for production defects only; defects and/or malfunctions caused by incorrect application or damage during transit and handling are not included;
- 4) warranty is not valid for malfunctions caused by normal wear and tear of the unit.
- 5) the product must not be disassembled, modified or anyhow manipulated;
- 6) SPAL Automotive reserves the right to inspect the part prior to accepting a warranty claim
- 7) for claims which fall under the general warranty conditions, SPAL Automotive will issue a credit note for the corresponding value of the part; no other costs will be accepted.

*Note: General fan/blower working conditions must be in line with what specified in the product data sheet. Please request SPAL for detailed product data sheet before selecting any item from the catalogue.*



## RECOMMENDATIONS FOR THE USE OF AXIAL FAN MODULES WITH BRUSHLESS MOTORS

-In order to maximize product life, the power supply must be rectified and stabilized with residual RIPPLE values of less than 3%. Higher RIPPLE values will considerably reduce motor life and cause anomalous operation. In case of application with higher RIPPLE values expected, please contact Spal at [info@spalautomotive.com](mailto:info@spalautomotive.com)

-For applications in which the fan module is mounted horizontally, you are required to use a fan blade with drain holes to allow water drainage (available upon request).

-For a proper protection of the fan module, use an external fuse correctly rated for every installed fan in order to interrupt the power supply in case of accidental blockage. This is an indispensable protection for wire harness and motor.

-For fan modules driven by an electronic speed control (linear, PWM or any other external speed control), please ensure that the external power supply is cut off in case of overload conditions such as partial or total blockage and over temperature.

-The electronic fan controller must be compatible to our products. Contact Spal at [info@spalautomotive.com](mailto:info@spalautomotive.com) for additional information.

-It is sole customer's responsibility to verify the environmental conditions for the proper use of the fan module. Contact Spal at [info@spalautomotive.com](mailto:info@spalautomotive.com) for additional information.

-It is sole customer's responsibility to adequately protect the system and the fan against overload conditions or accidental rotor blockage.

- It is sole customer's responsibility to verify that the selected product suits the technical requirements and working conditions according to its own specifications and application. In case of customer specific request, we will be pleased to support him to detect the best possible solutions; however SPAL will not release any declaration or guarantee regarding the suitability of the selected item. Full responsibility and liability remains with the customer.

-For any product update, please refer to [www.spalautomotive.com](http://www.spalautomotive.com)

-Never use blower modules in flammable, combustibles or blowing environments.

## RECOMMENDATIONS FOR THE USE OF CENTRIFUGAL BLOWER MODULES WITH BRUSHLESS MOTORS

-In order to maximize product life, the power supply must be rectified and stabilized with residual RIPPLE values of less than 3%. Higher RIPPLE values will considerably reduce motor life and cause anomalous operation. In case of application with higher RIPPLE values expected, please contact Spal at [info@spalautomotive.com](mailto:info@spalautomotive.com)

-For a proper protection of the blower module, use an external fuse correctly rated for every installed fan in order to interrupt the power supply in case of accidental blockage. This is an indispensable protection for wire harness and motor.

-For blower modules driven by an electronic speed control (linear, PWM or any other external speed control), please ensure that the external power supply is cut off in case of overload conditions such as partial or total blockage and over temperature.

-The electronic fan controller must be compatible to our products. Contact Spal at [info@spalautomotive.com](mailto:info@spalautomotive.com) for additional information.

-It is sole customer's responsibility to verify the environmental conditions for the proper use of the fan module. Contact Spal at [info@spalautomotive.com](mailto:info@spalautomotive.com) for additional information.

-It is sole customer's responsibility to adequately protect the system and the fan against overload conditions or accidental rotor blockage.

-It is sole customer's responsibility to verify that the selected product suits the technical requirements and working conditions according to its own specifications and application. In case of customer specific request, we will be pleased to support him to detect the best possible solutions; however SPAL will not release any declaration or guarantee regarding the suitability of the selected item. Full responsibility and liability remains with the customer.

-For any product update, please refer to [www.spalautomotive.com](http://www.spalautomotive.com)

-Never use blower modules in flammable, combustibles or blowing environments.



- Failure to strictly follow these recommendations could cause the product to fail, resulting in a fire, severe personal injury or even death.

- Should you have any questions, contact SPAL at [info@spalautomotive.com](mailto:info@spalautomotive.com)



- Failure to strictly follow these recommendations could cause the product to fail, resulting in a fire, severe personal injury or even death.

- Should you have any questions, contact SPAL at [info@spalautomotive.com](mailto:info@spalautomotive.com)





**SPAL**  
AUTOMOTIVE

HIGH-PERFORMANCE  
SEALED BRUSHLESS MOTOR FANS & BLOWERS

12V

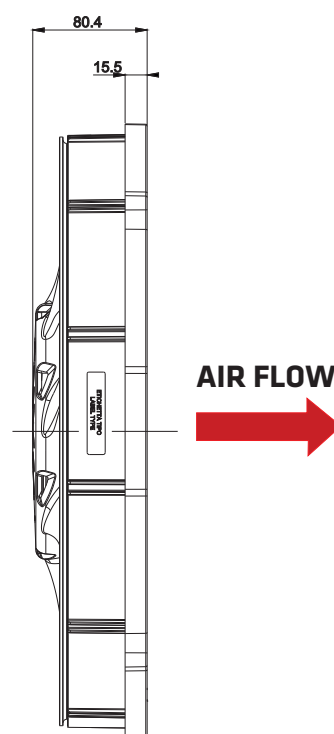
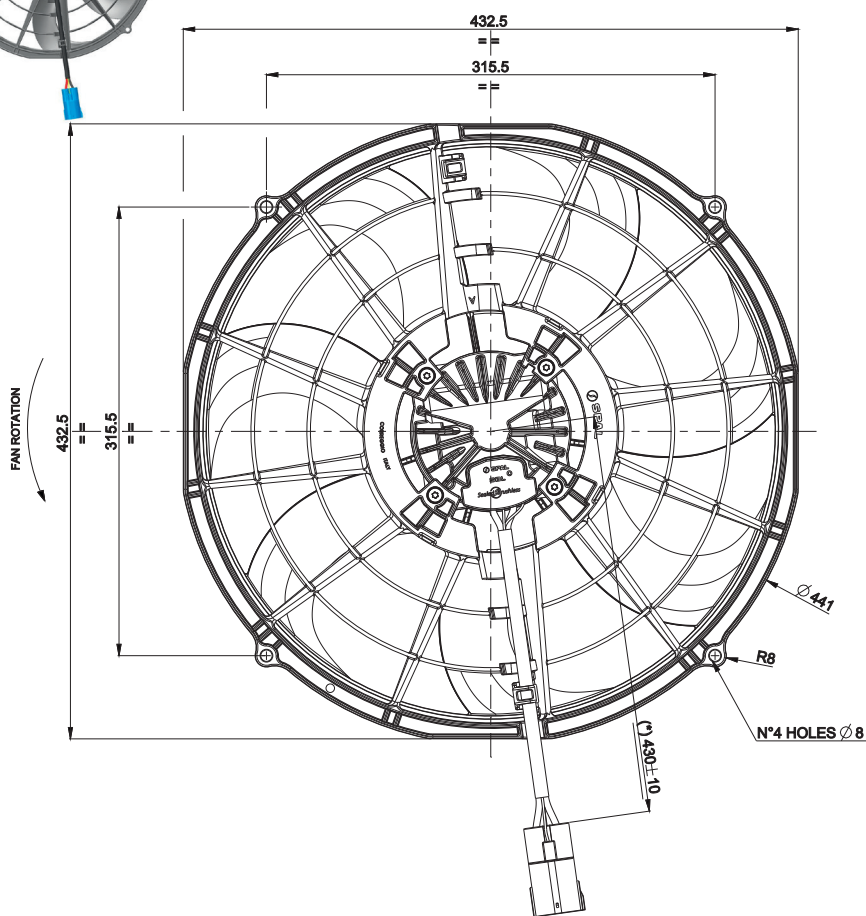
12V

Ø 405 mm  
Ø 16"

## VA117-ABL506P-103A

### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

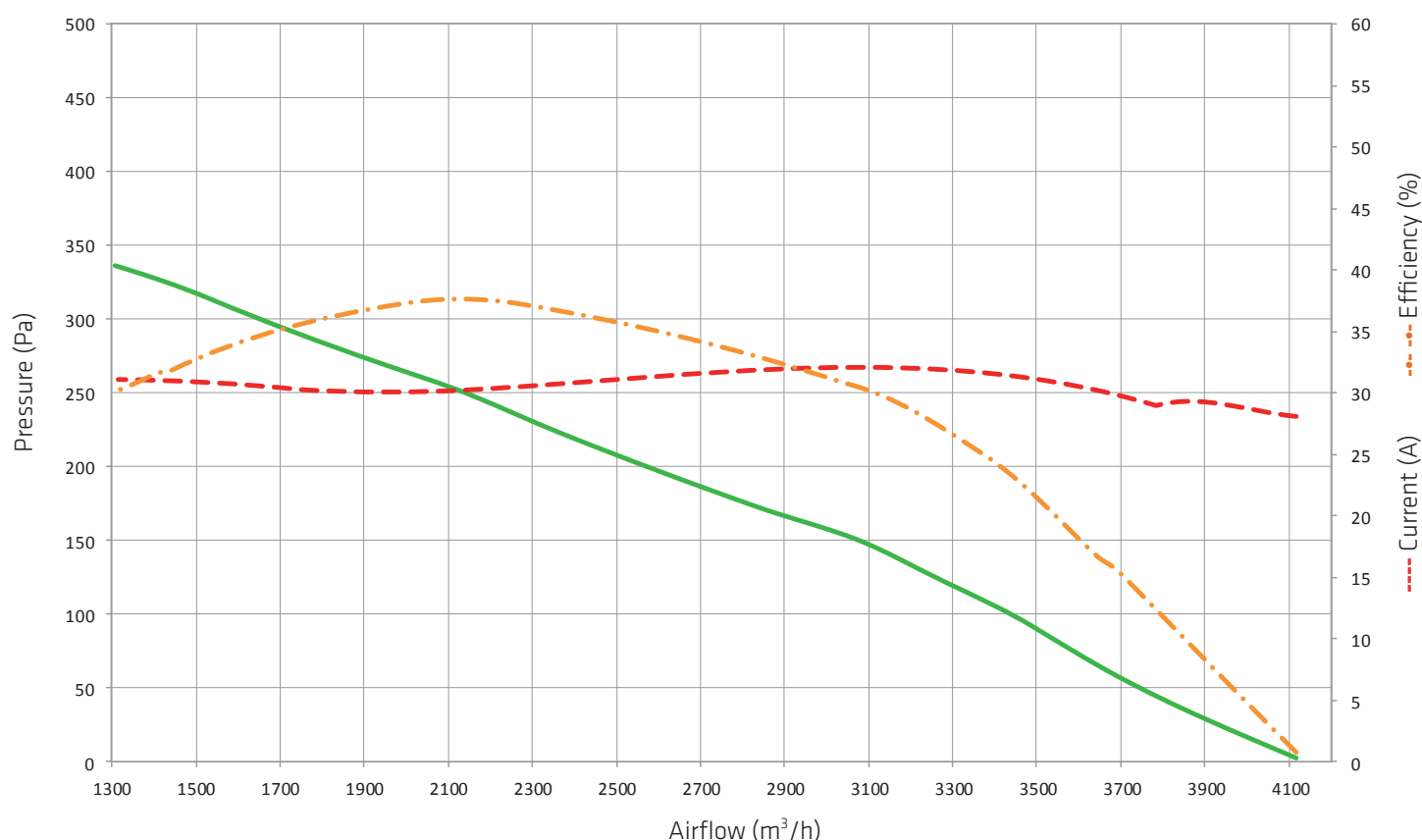
	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm²]	6.0	6.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA117-ABL506P-103A

Ø 405 mm  
Ø 16"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

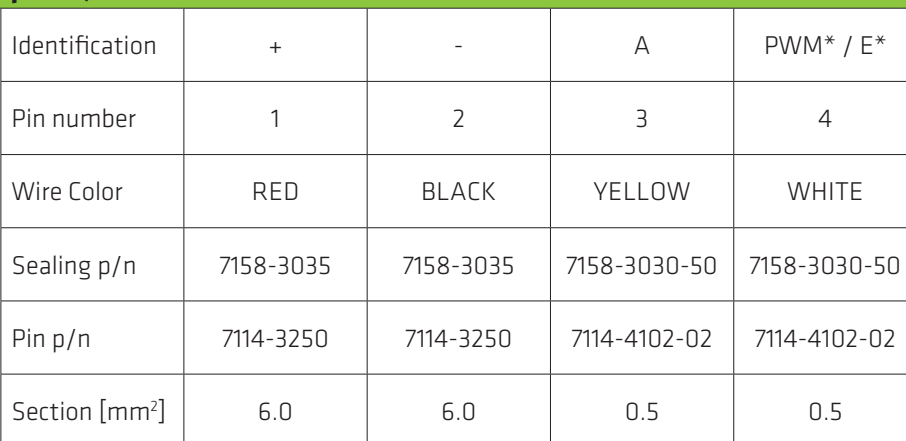
Max fan speed	rpm	2800
Min fan speed	rpm	700
Sound pressure level	dBA	72.8 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	3.10
Operating supply voltage range	V	9.0 .. 16.0 at the Drive Connector
Supply voltage to reach max speed	V	13.0 .. 16.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +120
Speed derating threshold	°C	+105 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	17
Load dump protection (Pulse 5b)	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

**VA97-ABL322P/N-103A**



All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**

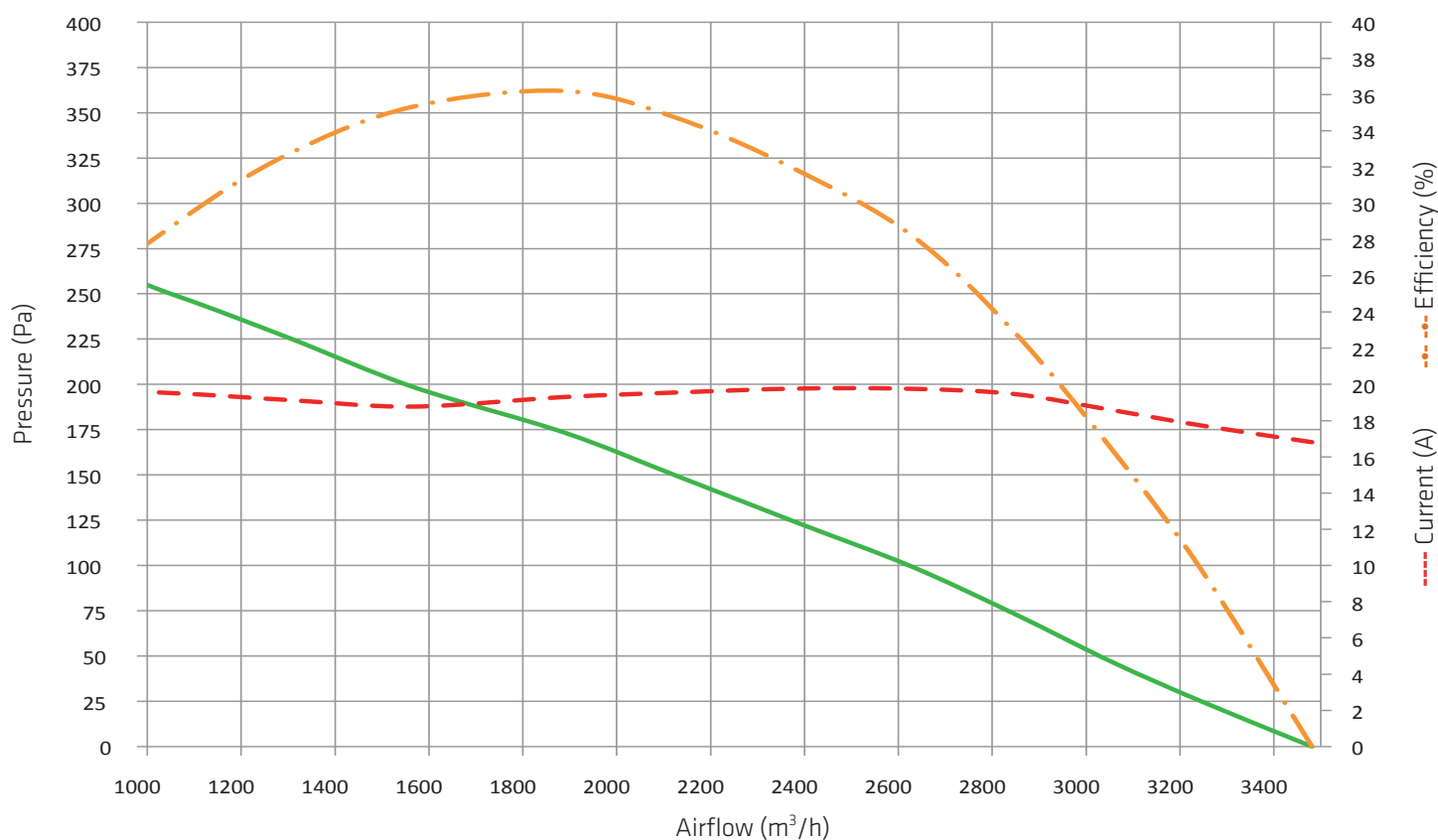


**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA97-ABL322P/N-103A

Ø 405 mm  
Ø 16"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	2350
Min fan speed	rpm	600
Sound pressure level	dBA	71.2 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.7
Operating supply voltage range	V	9.0 .. 16.0 at the Drive Connector
Supply voltage to reach max speed	V	13.0 .. 16.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +115
Speed derating threshold	°C	+105 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	10
Load dump protection (Pulse 5b)	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

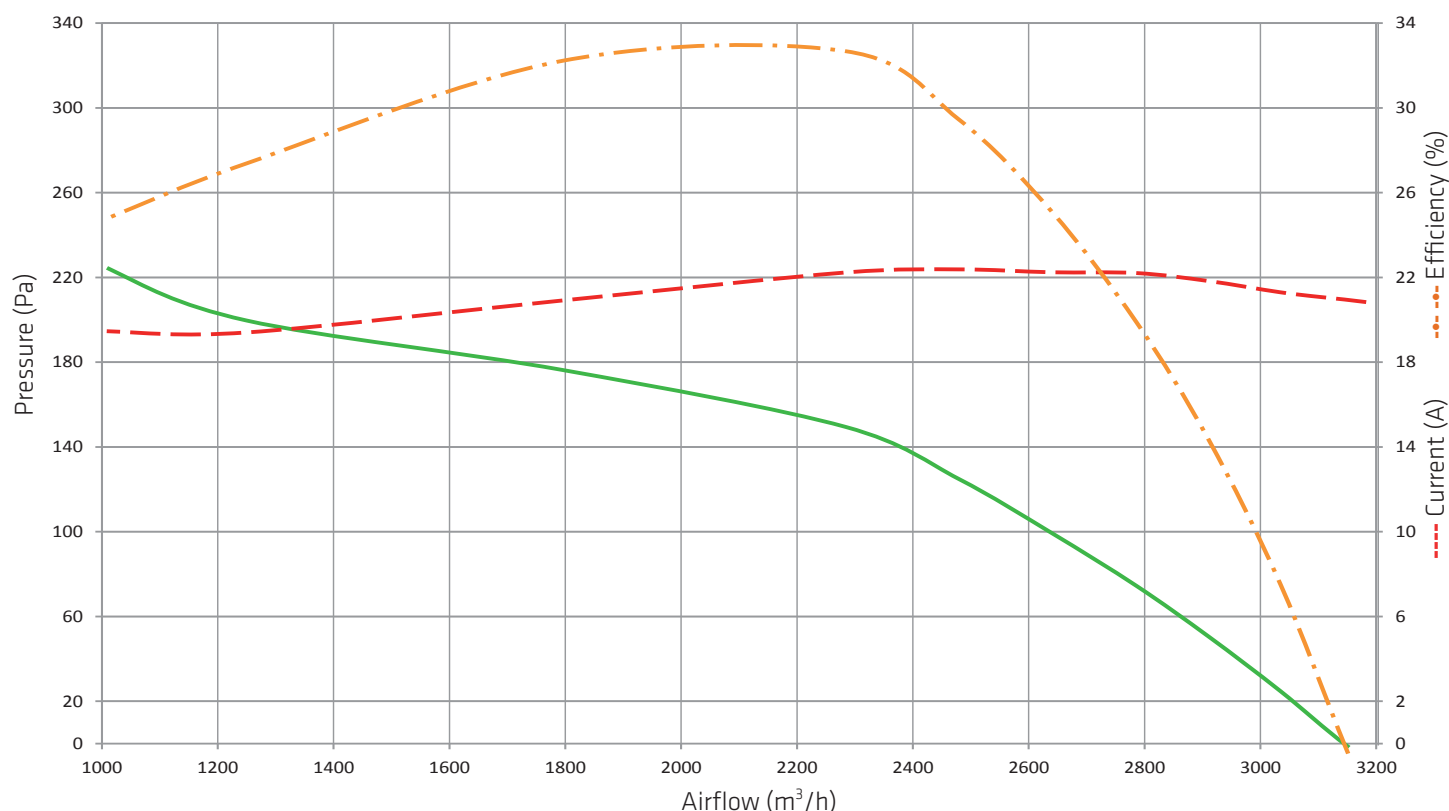
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.



12V

**VA91-ABL326P/N-65A****Ø 385 mm**  
**Ø 15.2"**

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

<b>Max fan speed</b>	rpm	2500
<b>Min fan speed</b>	rpm	850
<b>Sound pressure level</b>	dBA	77 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.4
<b>Operating supply voltage range</b>	V	9.0 .. 16.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	13.0 .. 16.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +120
<b>Speed derating threshold</b>	°C	+85 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	14.5
<b>Load dump protection (Pulse 5b)</b>	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

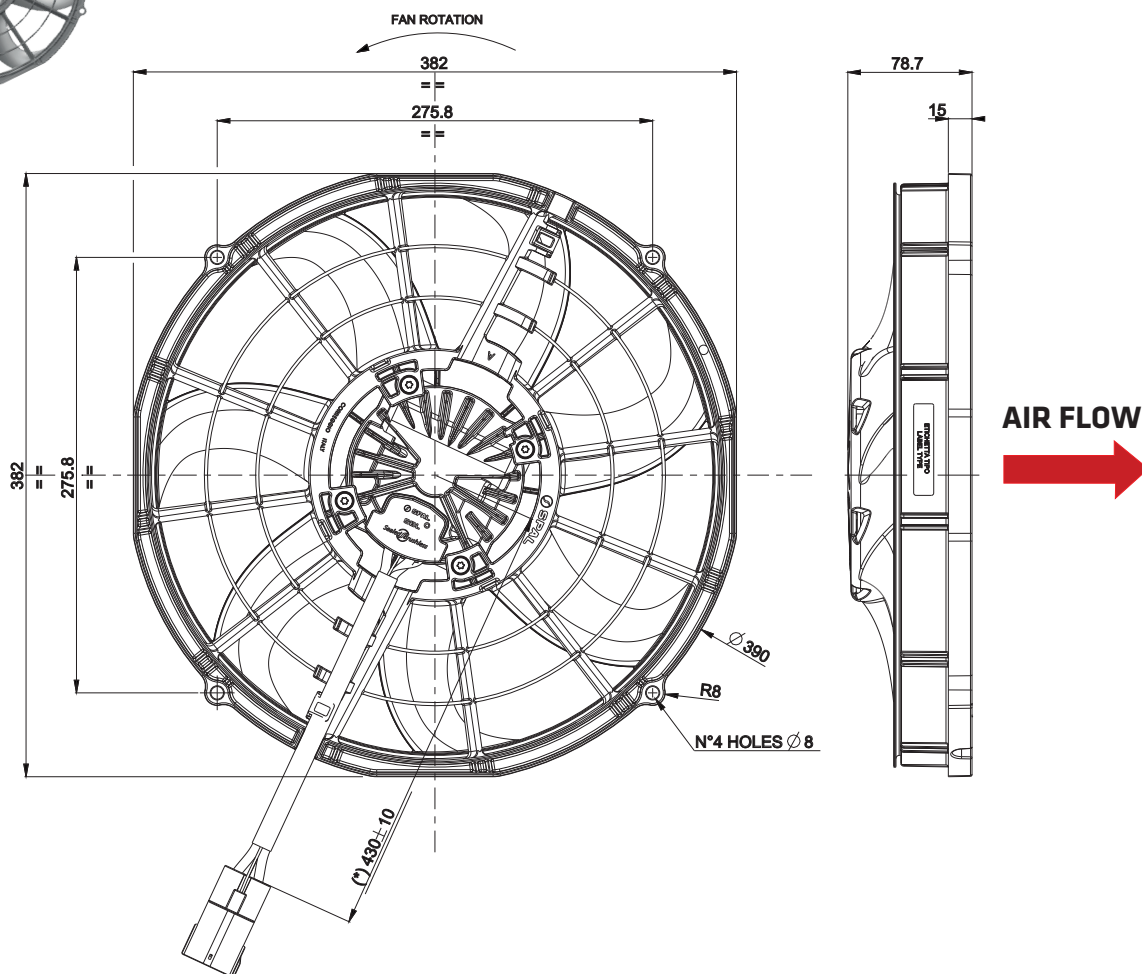
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 355 mm  
Ø 14"

## VA116-ABL505P-105A

### Technical Data

- All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm
- Motors certified **IP6K9K** and **IP68**



### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

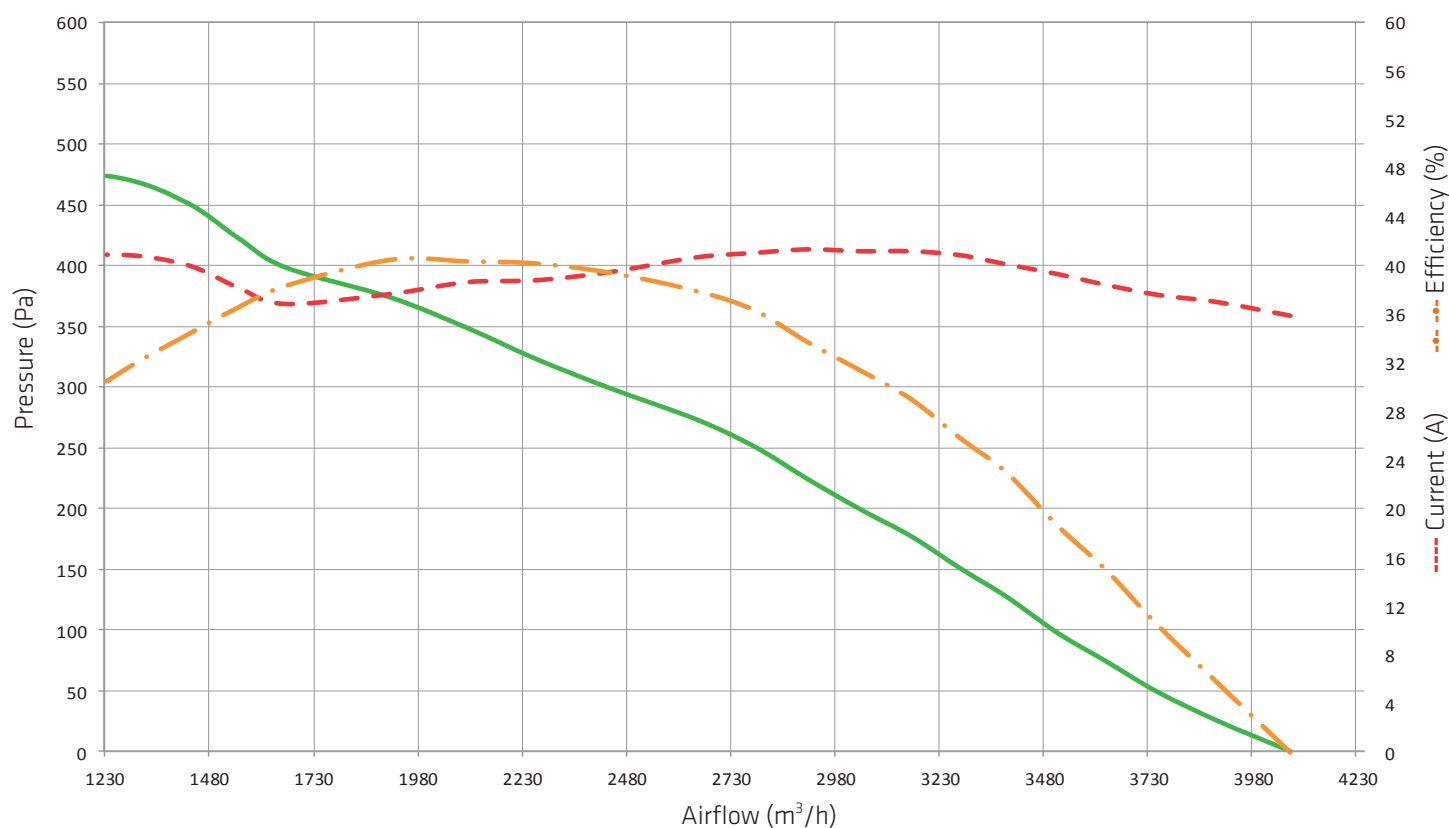
<p>4. WHITE SECT. 0.5 mm<sup>2</sup></p> <p>1. RED SECT. 10.0 mm<sup>2</sup> +</p> <p>2. BLACK SECT. 10.0 mm<sup>2</sup> -</p> <p>3. YELLOW SECT. 0.5 mm<sup>2</sup></p>	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3036-70	7158-3036-70	7158-3030-50	7158-3030-50
	Pin p/n	7114-3273-02	7114-3273-02	7114-4102-02	7114-4102-02
	Section [mm <sup>2</sup> ]	10.0	10.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA116-ABL505P-105A

Ø 355 mm  
Ø 14"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

<b>Max fan speed</b>	rpm	3300
<b>Min fan speed</b>	rpm	800
<b>Sound pressure level</b>	dBA	77.2 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.80
<b>Operating supply voltage range</b>	V	9.0 .. 16.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	13.0 .. 16.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +120
<b>Speed derating threshold</b>	°C	+105 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	17
<b>Load dump protection (Pulse 5b)</b>	V	35 - Pulse peak voltage (Us *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

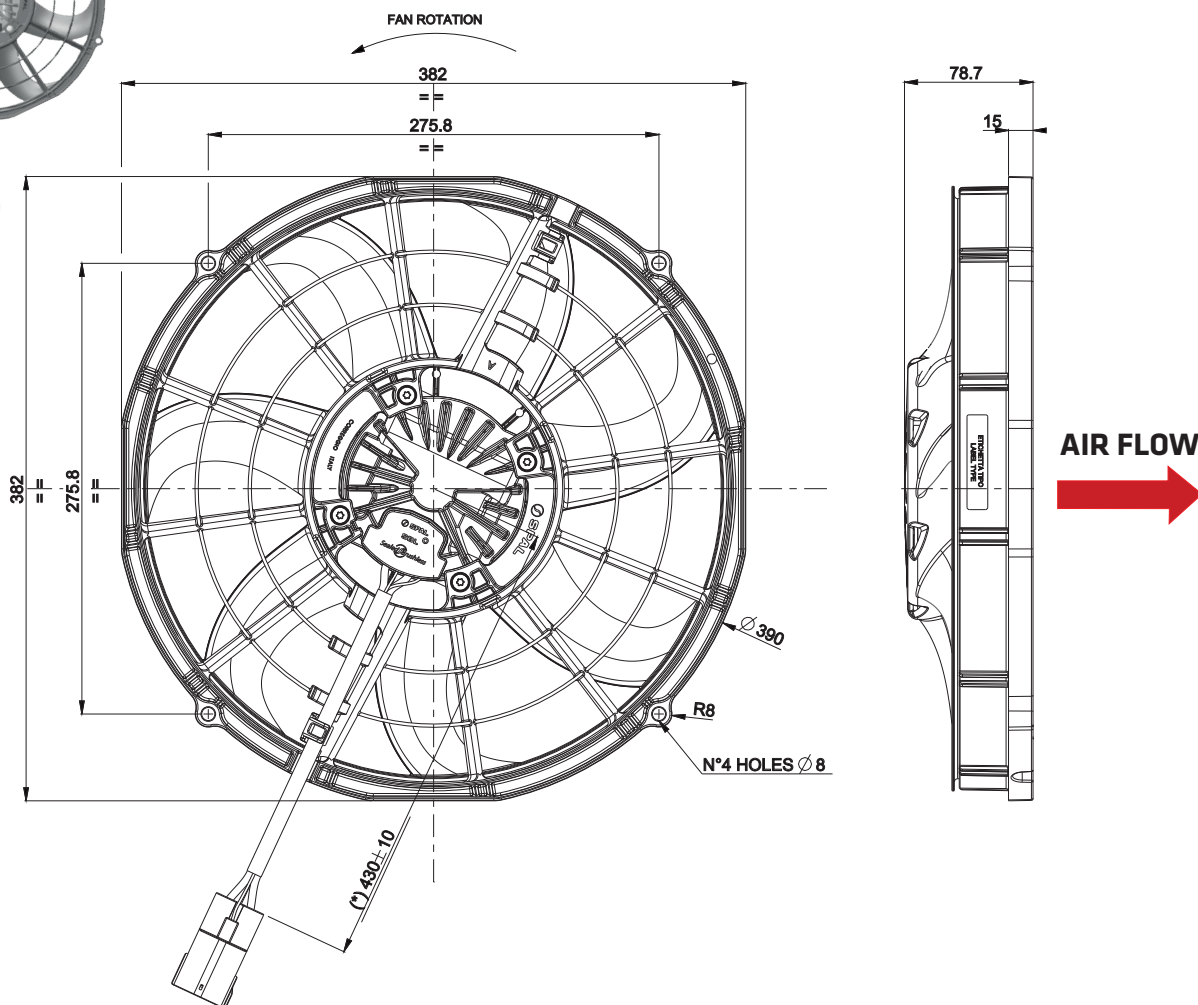
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 355 mm  
Ø 14"

## VA116-ABL324P-105A

### Technical Data

- All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm
- Motors certified **IP6K9K** and **IP68**



**Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90**

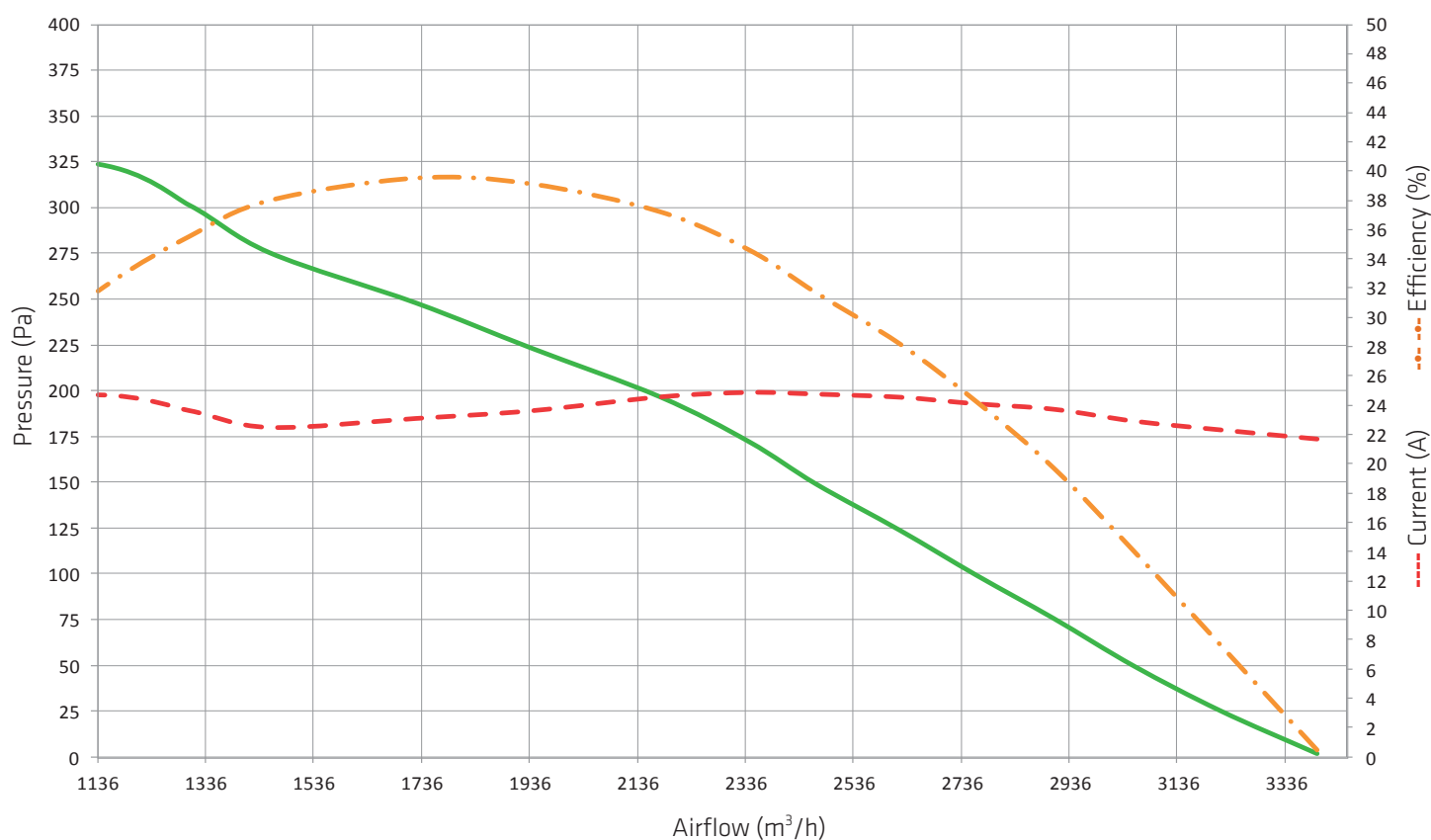
	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm²]	6.0	6.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA116-ABL324P-105A

Ø 355 mm  
Ø 14"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	2800
Min fan speed	rpm	700
Sound pressure level	dBA	73.7 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.40
Operating supply voltage range	V	9.0 .. 16.0 at the Drive Connector
Supply voltage to reach max speed	V	13.0 .. 16.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +120
Speed derating threshold	°C	+105 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	17
Load dump protection (Pulse 5b)	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

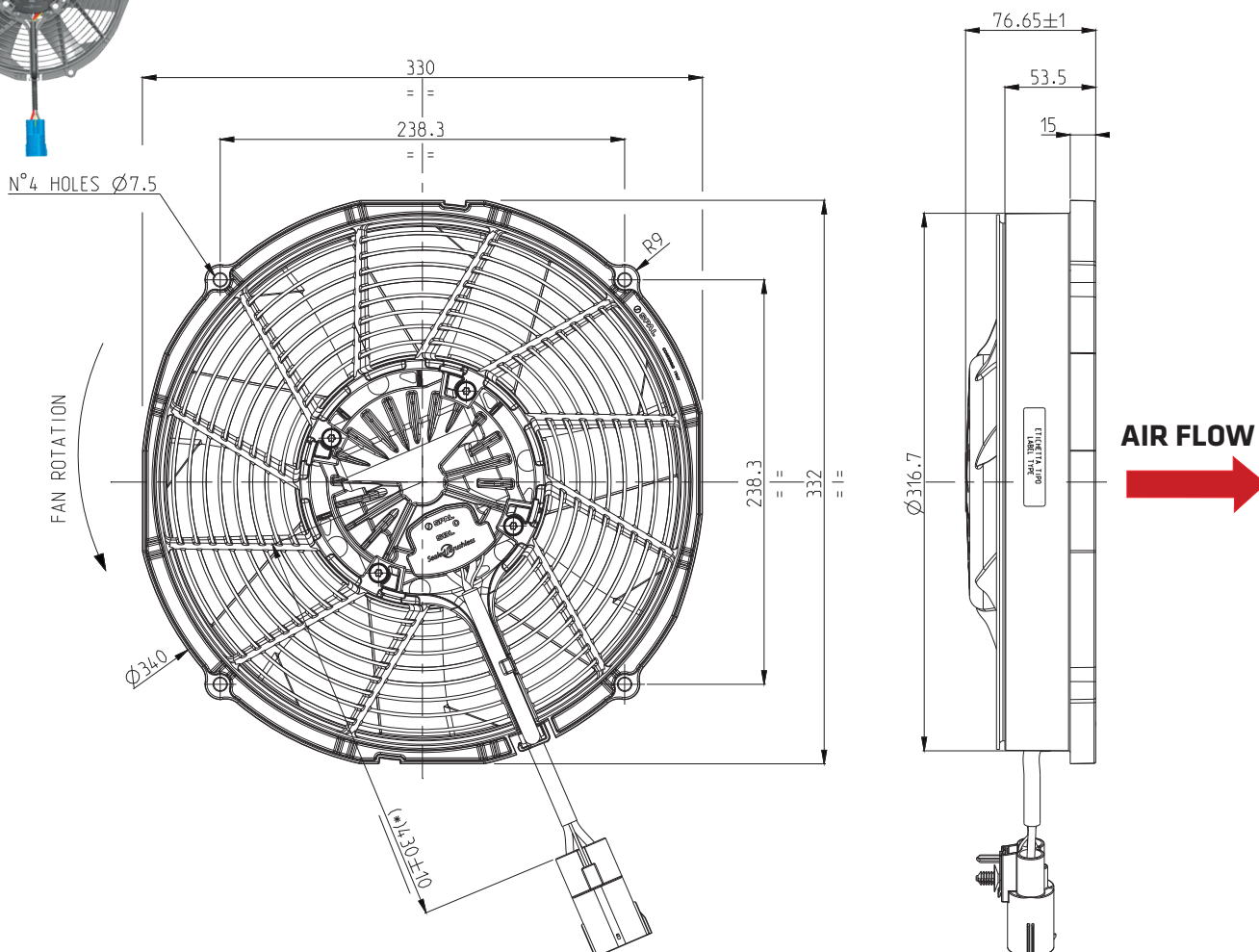
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 305 mm  
Ø 12"

## VA90-ABL320P/N-94A

### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**

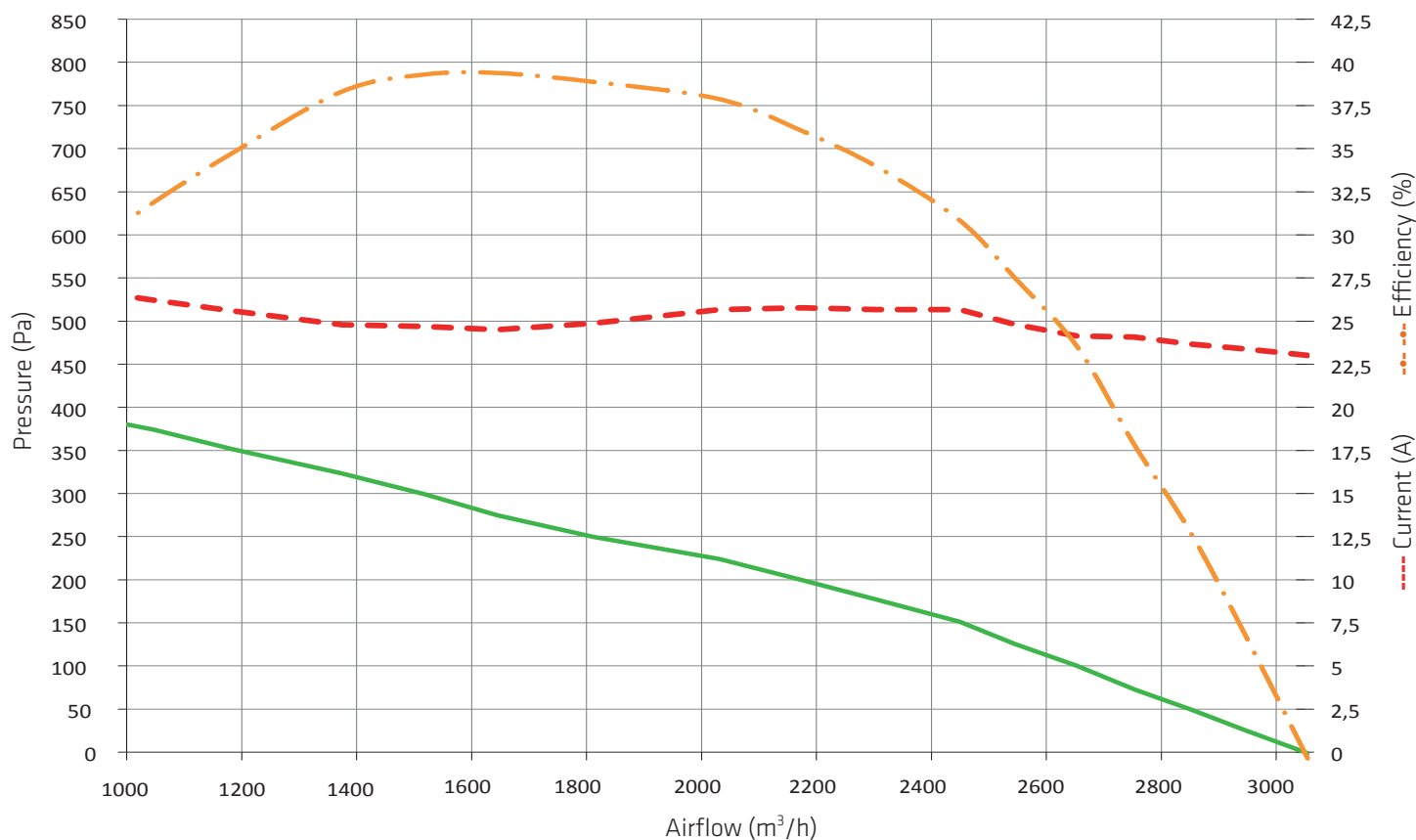


Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm²]	6.0	6.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

12V

**VA90-ABL320P/N-94A****Ø 305 mm****Ø 12"****Performance Curve**Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

**Features**

<b>Max fan speed</b>	rpm	3500
<b>Min fan speed</b>	rpm	900
<b>Sound pressure level</b>	dBA	77 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.41
<b>Operating supply voltage range</b>	V	9.0 .. 16.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	13.0 .. 16.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +115
<b>Speed derating threshold</b>	°C	+105 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	10
<b>Load dump protection (Pulse 5b)</b>	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

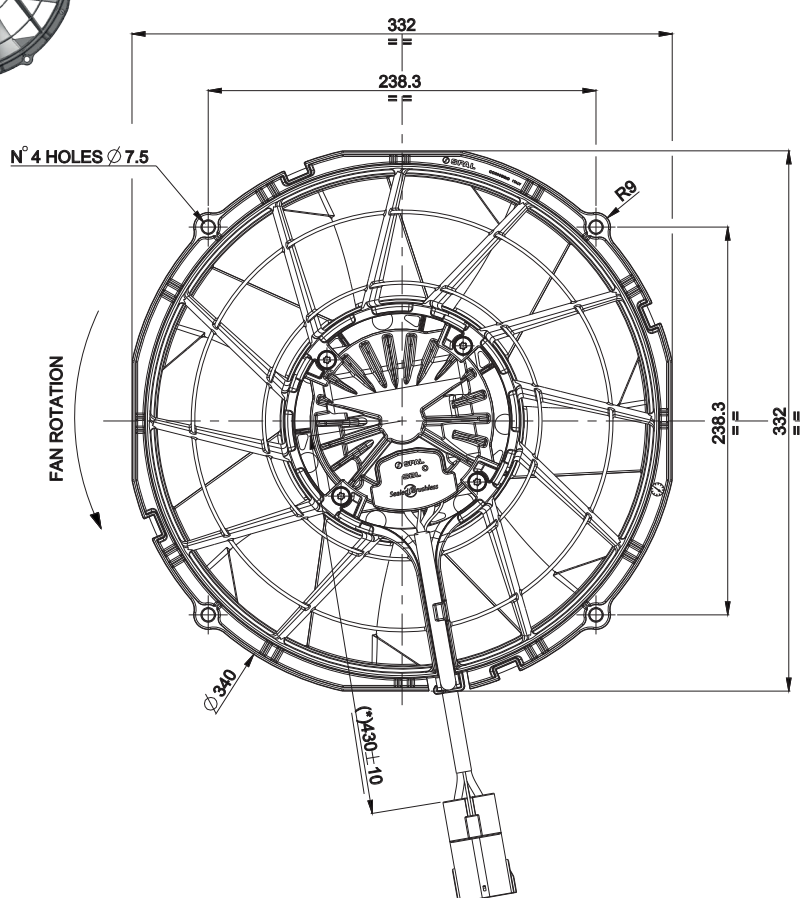
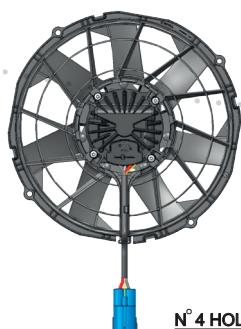
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 305 mm  
Ø 12"

## VA89-ABL320P/N-94A

### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+D	-D	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm²]	6.0	6.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

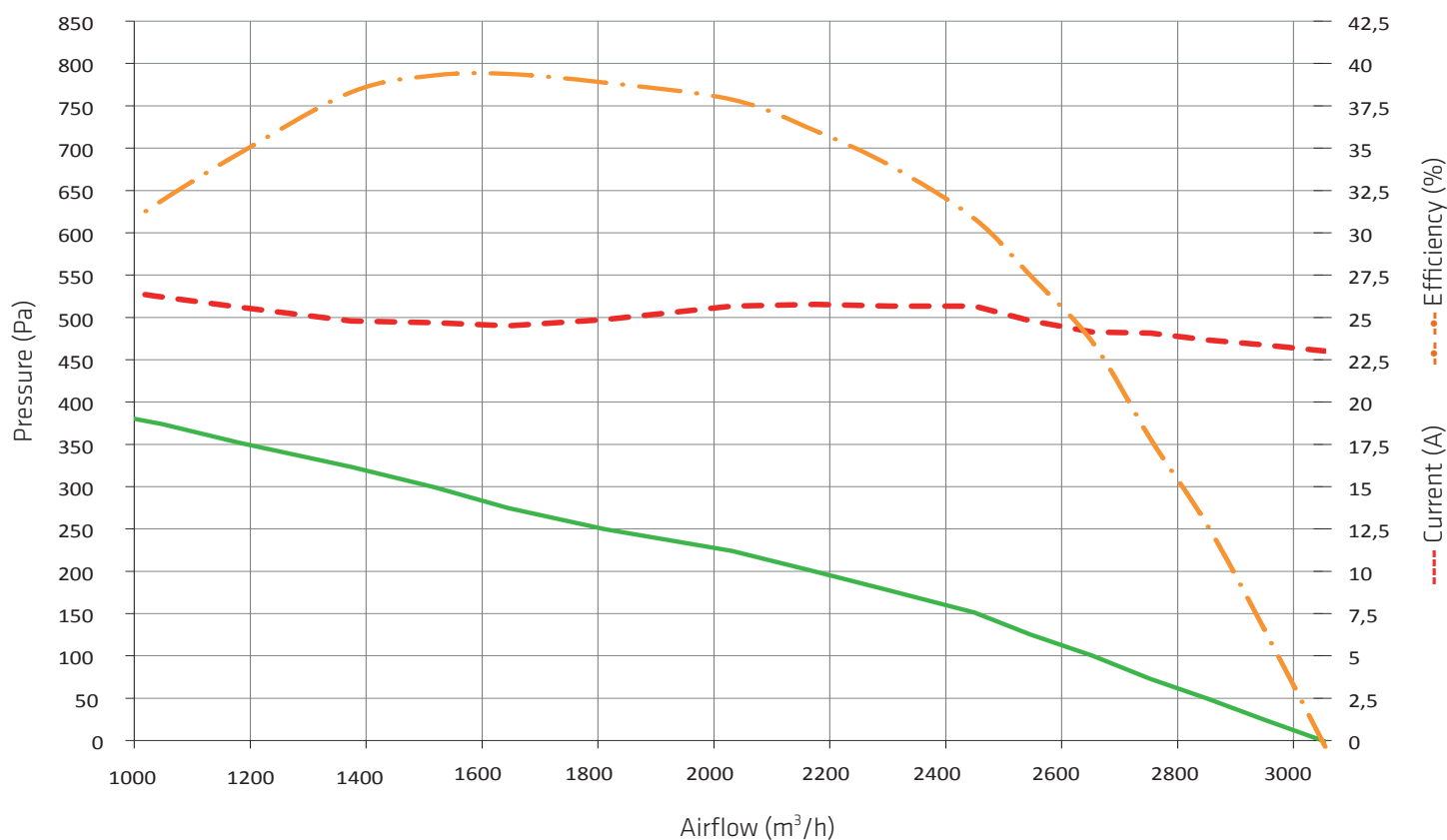
12V

VA89-ABL320P/N-94A

Ø 305 mm

Ø 12"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

<b>Max fan speed</b>	rpm	3500
<b>Min fan speed</b>	rpm	900
<b>Sound pressure level</b>	dBA	77 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.25
<b>Operating supply voltage range</b>	V	9.0 .. 16.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	13.0 .. 16.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +115
<b>Speed derating threshold</b>	°C	+105 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	10
<b>Load dump protection (Pulse 5b)</b>	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

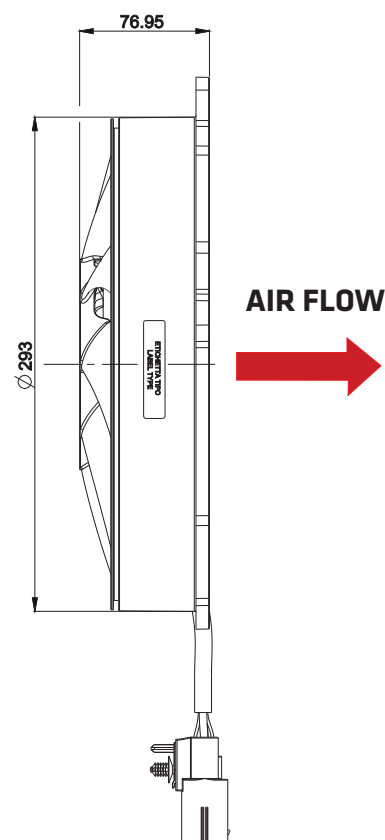
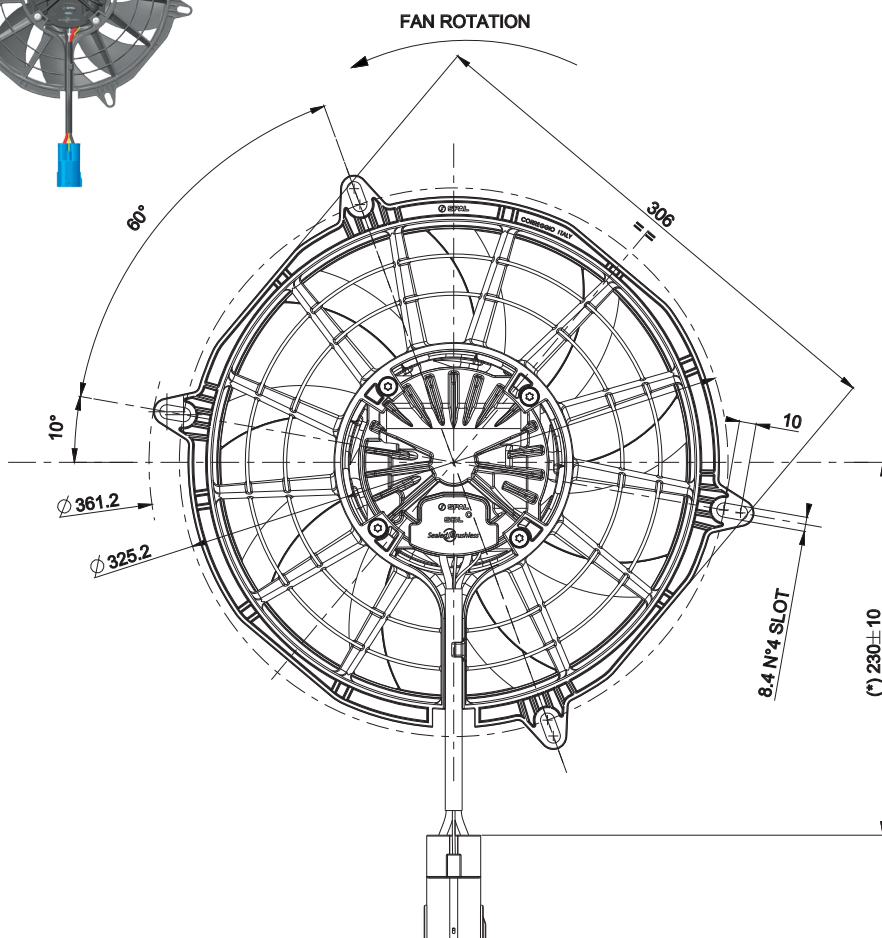
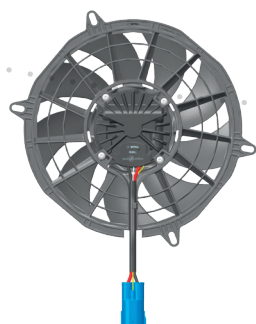
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 280 mm  
Ø 11"

## VA99-ABL315P/N-101A/SH

### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm²]	6.0	6.0	0.5	0.5

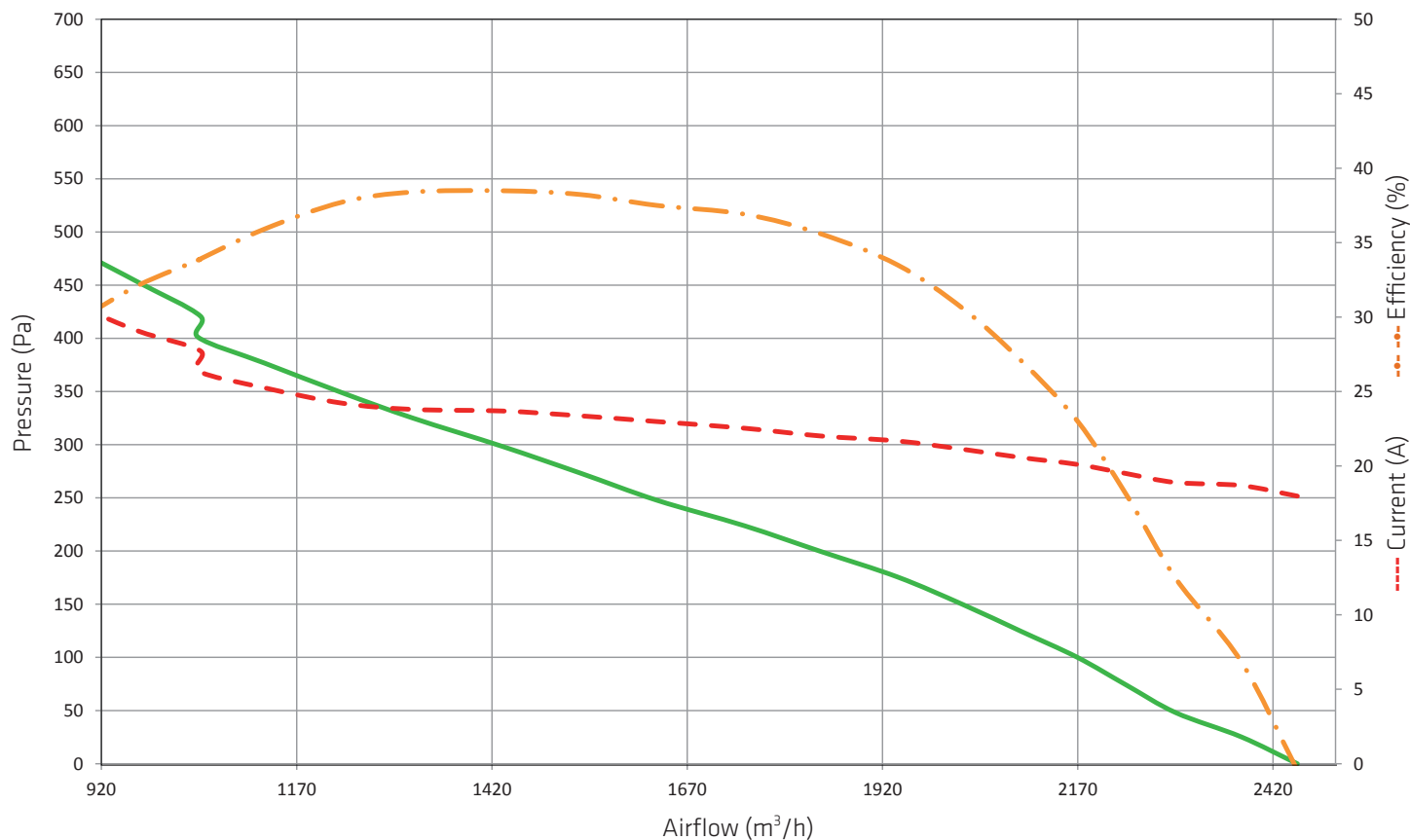
**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA99-ABL315P/N-101A/SH

Ø 280 mm

Ø 11"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	3800
Min fan speed	rpm	950
Sound pressure level	dBA	73.8 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.20
Operating supply voltage range	V	9.0 .. 16.0 at the Drive Connector
Supply voltage to reach max speed	V	13.0 .. 16.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. + 120
Speed derating threshold	°C	+105 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	15.0
Load dump protection (Pulse 5b)	V	35 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

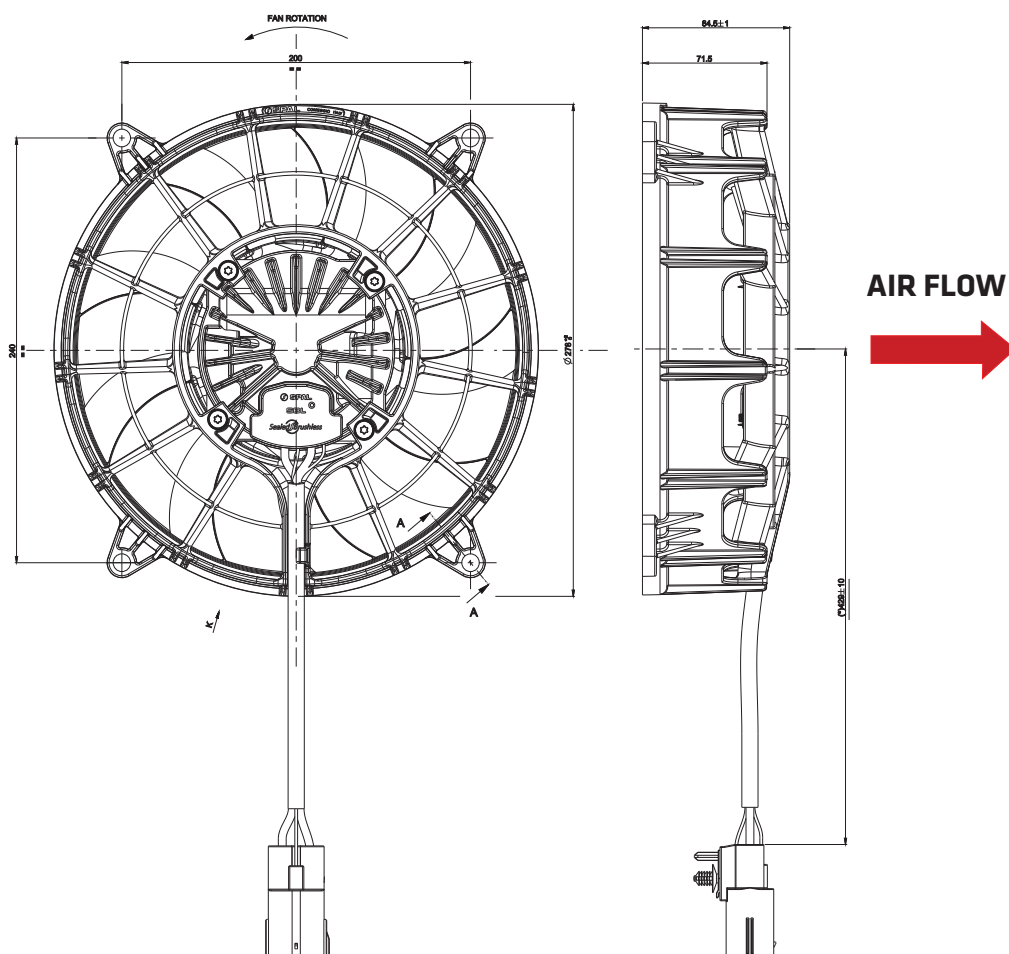
Ø 255 mm  
Ø 10"

**VA109-ABL321P/N-109A/SH**



## Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

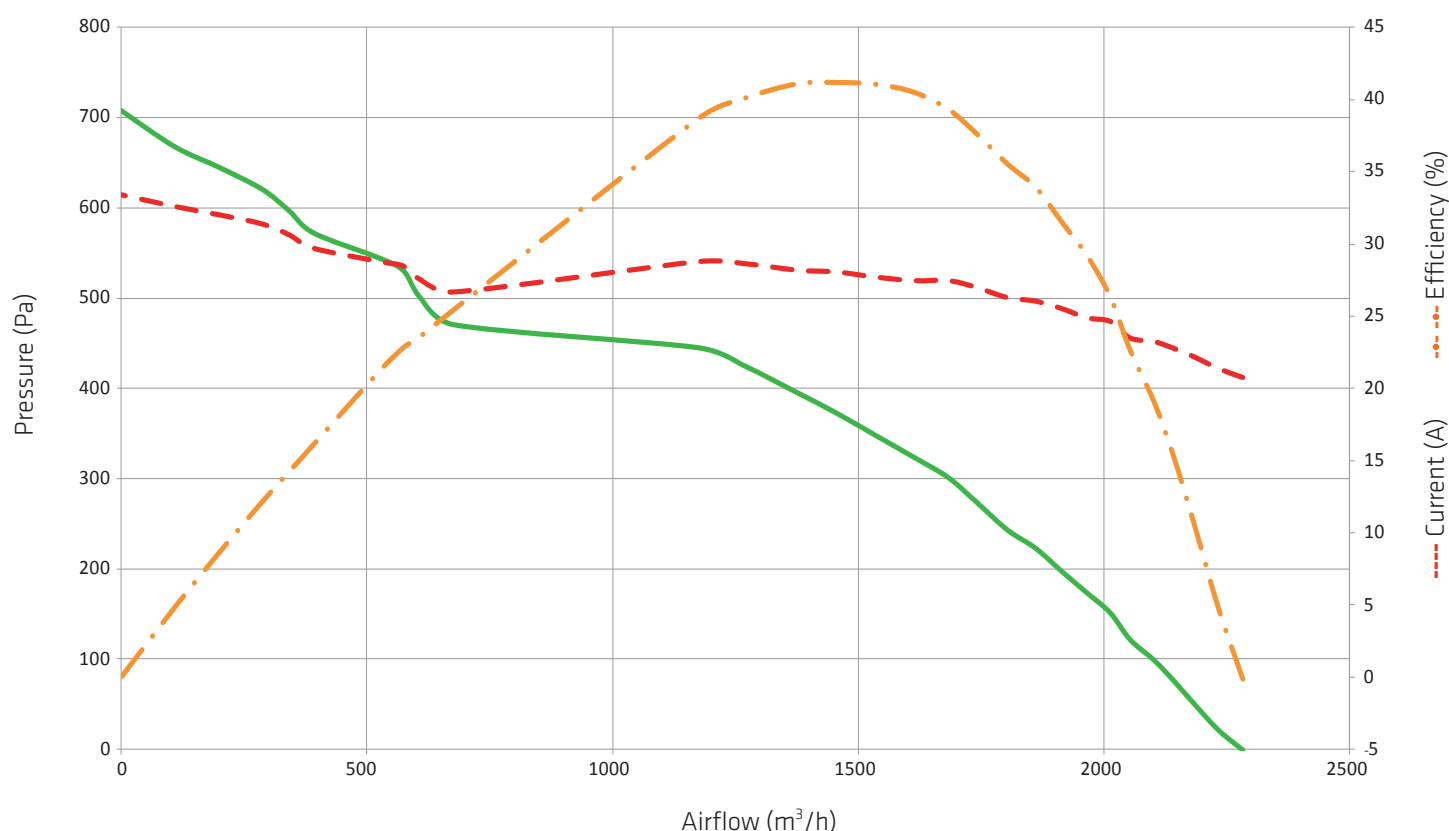
<p>2. BLACK SECT. 6.0 mm<sup>2</sup></p> <p>3. YELLOW SECT. 0.5 mm<sup>2</sup></p> <p>4. WHITE SECT. 0.5 mm<sup>2</sup></p> <p>1. RED SECT. 6.0 mm<sup>2</sup></p>	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm <sup>2</sup> ]	6.0	6.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA109-ABL321P/N-109A/SH

Ø 255 mm  
Ø 10"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

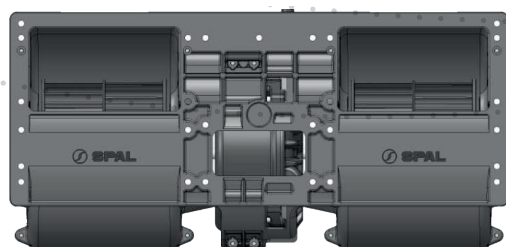
## Features

Max fan speed	rpm	4000
Min fan speed	rpm	1000
Sound pressure level	dBA	75.6 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.0
Operating supply voltage range	V	9.0 .. 16.0 at the Drive Connector
Supply voltage to reach max speed	V	13.0 .. 16.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +115
Speed derating threshold	°C	+105 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	14
Load dump protection (Pulse 5b)	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

020

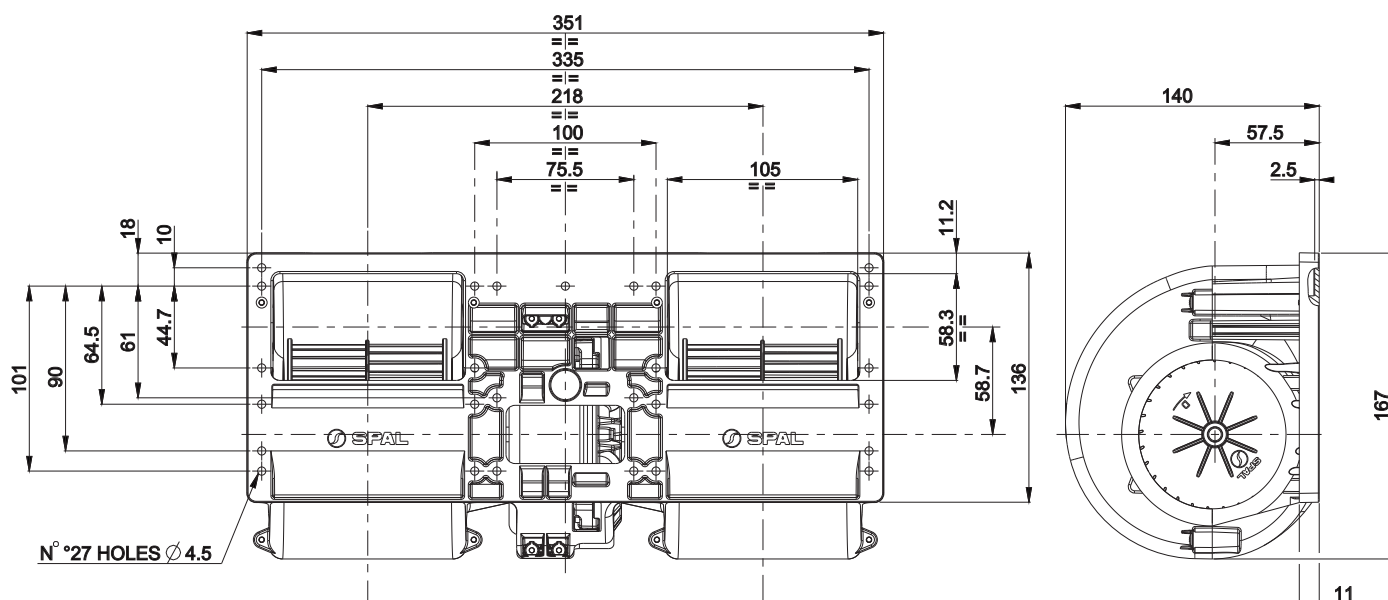
020-ABL313P/N-95



## Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm

Motors certified **IP6K9K** and **IP68**

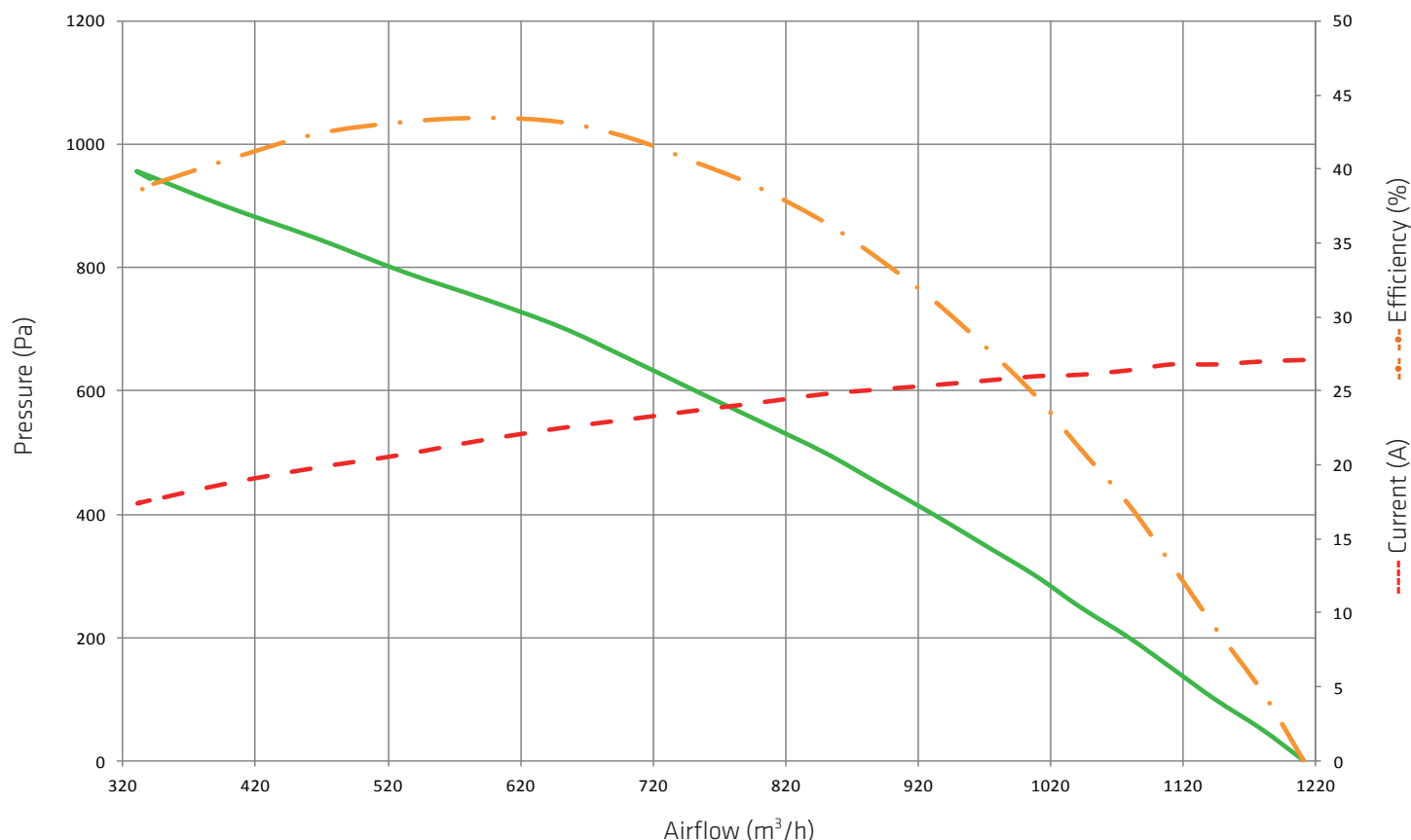


## Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## Performance Curve



Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

### Features

<b>Max fan speed</b>	rpm	3680
<b>Min fan speed</b>	rpm	1100
<b>Sound pressure level</b>	dBA	73.1 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.7
<b>Operating supply voltage range</b>	V	9.0 .. 16.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	13.0 .. 16.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +95
<b>Speed derating threshold</b>	°C	+85 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	13
<b>Load dump protection (Pulse 5b)</b>	V	35 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.



SIFA  
CORREGGIO ITALY



**SPAL**  
AUTOMOTIVE

HIGH-PERFORMANCE  
SEALED BRUSHLESS MOTOR FANS & BLOWERS

24V

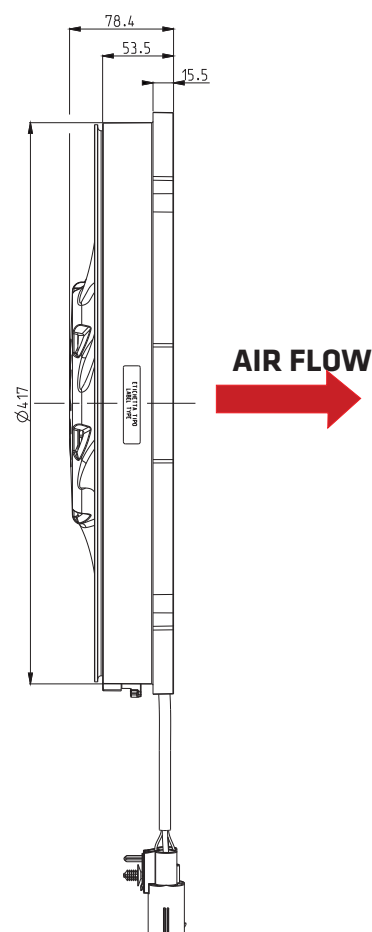
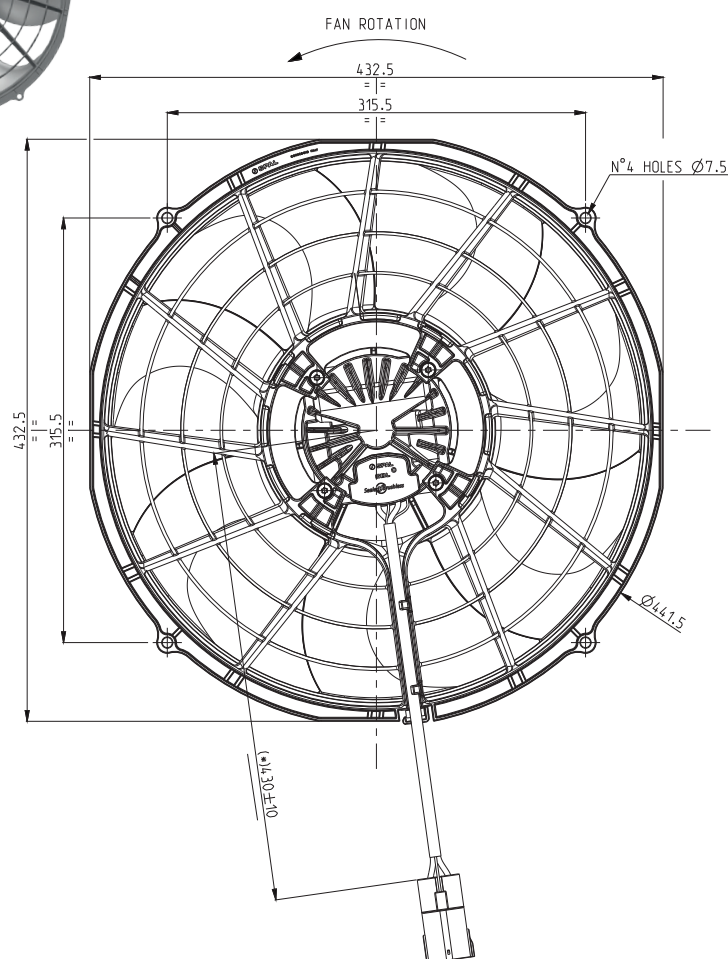
24V

Ø 405 mm  
Ø 16"

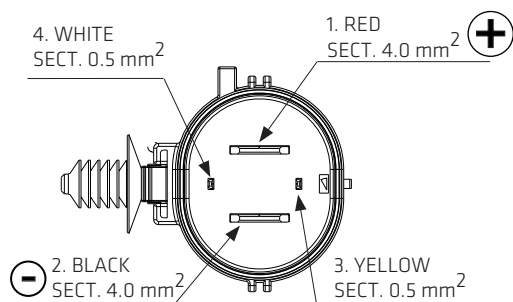
### VA97-BBL339P/N-103A

#### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



**Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90**



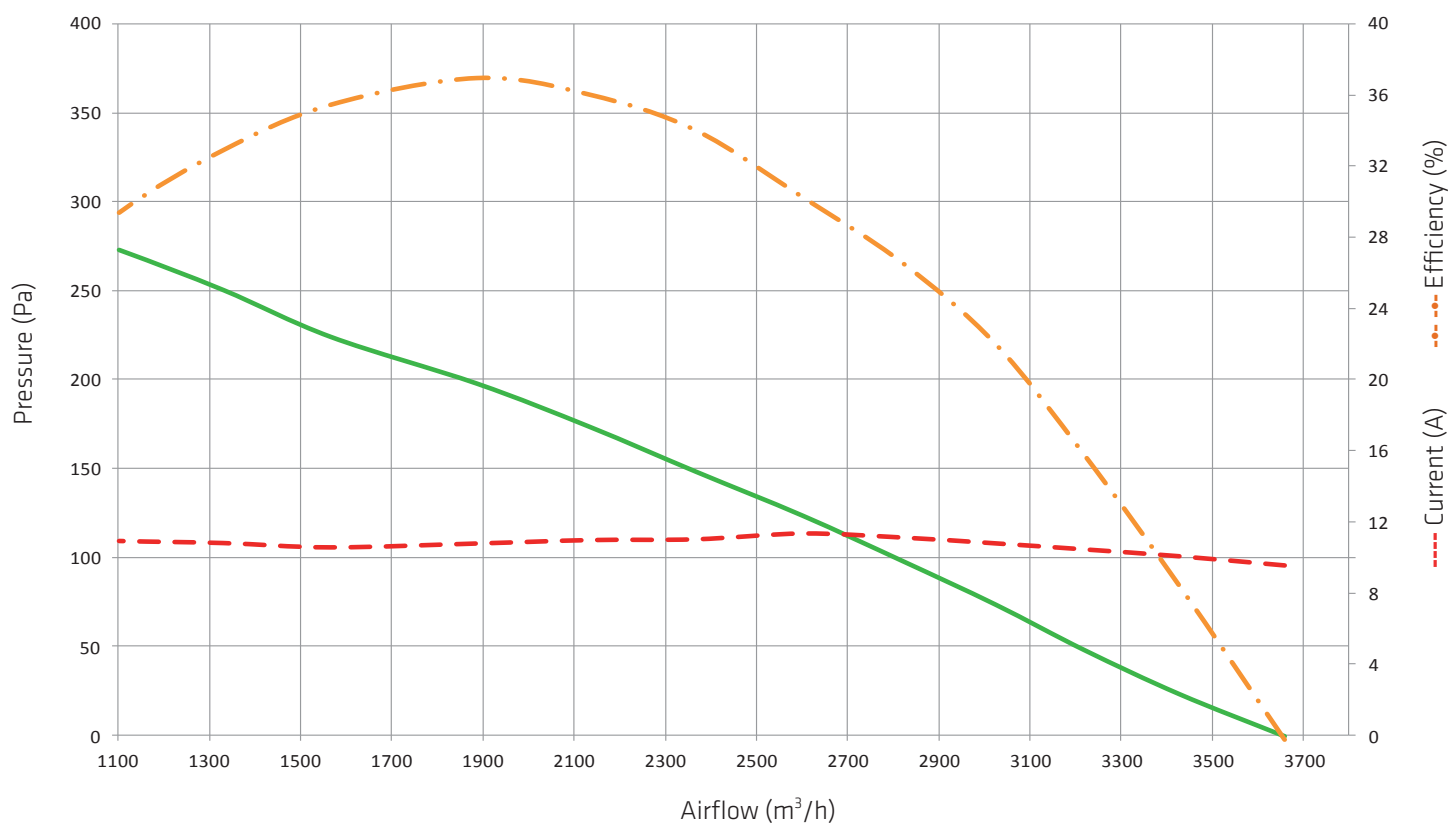
Identification	+	-	A	PWM* / E*
Pin number	1	2	3	4
Wire Color	RED	BLACK	YELLOW	WHITE
Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA97-BBL339P/N-103A

Ø 405 mm  
Ø 16"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	2450
Min fan speed	rpm	600
Sound pressure level	dBA	72.8 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.80
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +95
Speed derating threshold	°C	+85 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	17
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (Us *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

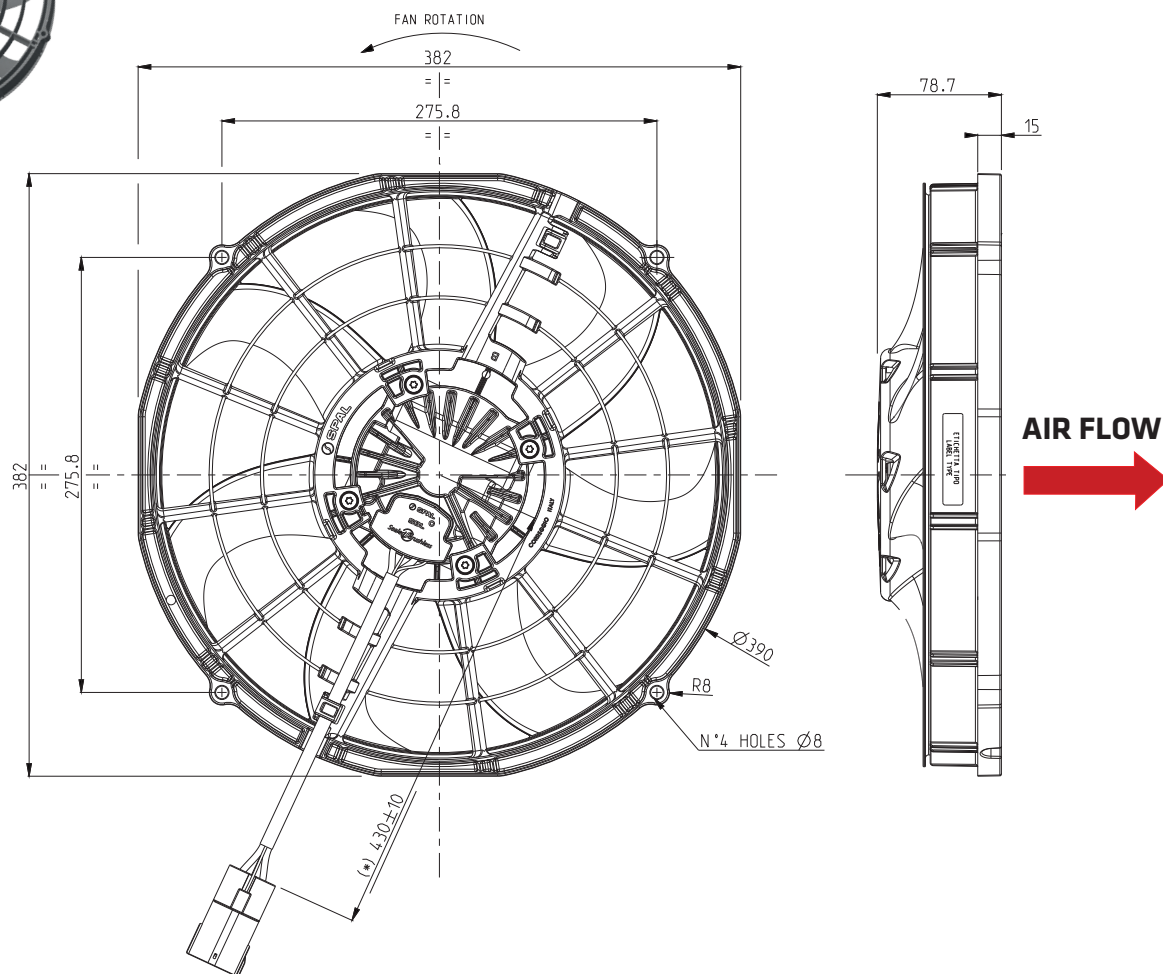
Ø 355 mm  
Ø 14"

### VA116-BBL511P/N-105A

#### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm

Motors certified **IP6K9K** and **IP68**



Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

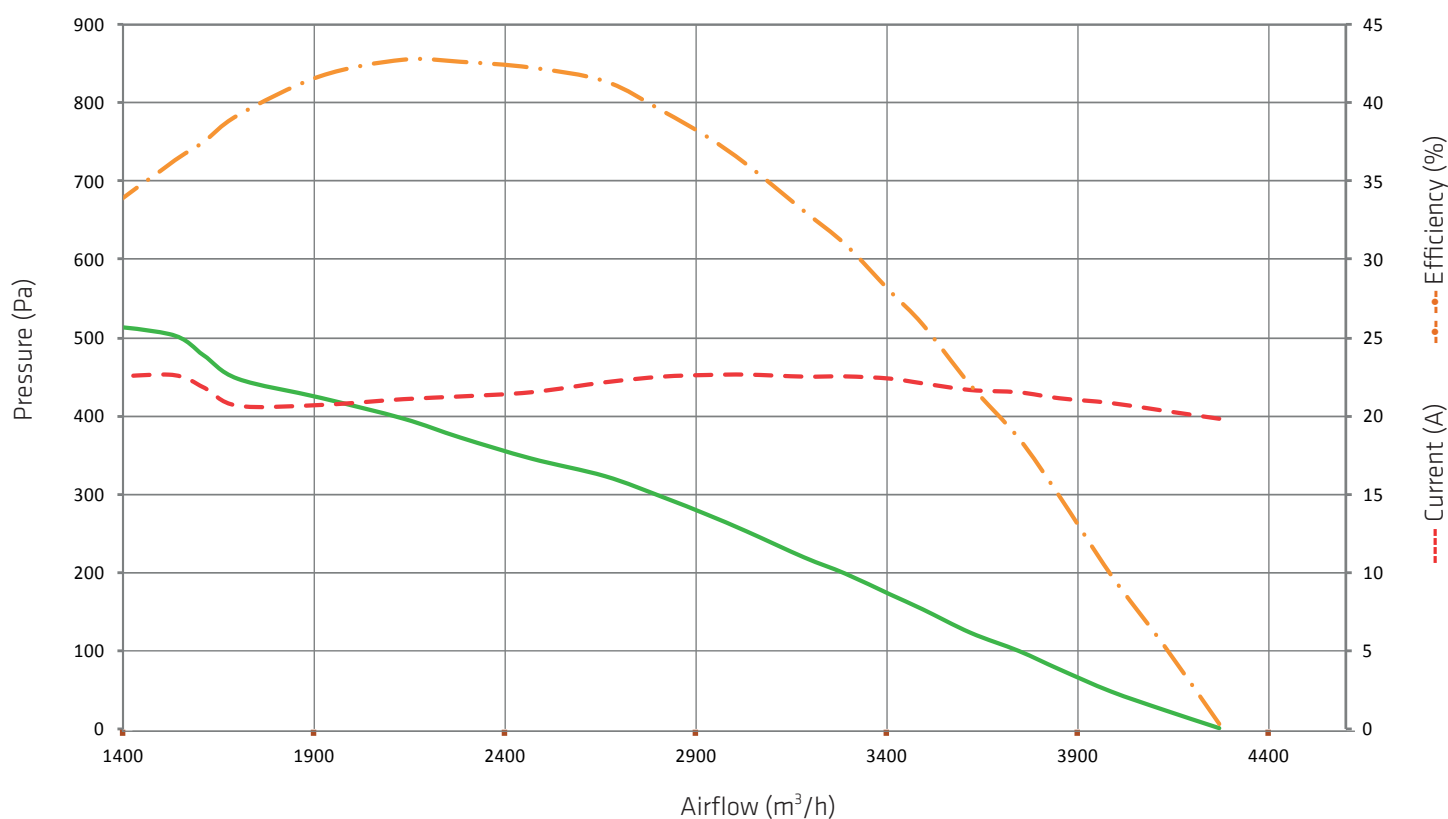
	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA116-BBL511P/N-105A

Ø 355 mm  
Ø 14"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	3500
Min fan speed	rpm	900
Sound pressure level	dBA	79.5 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.80
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +95
Speed derating threshold	°C	+85 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	11
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

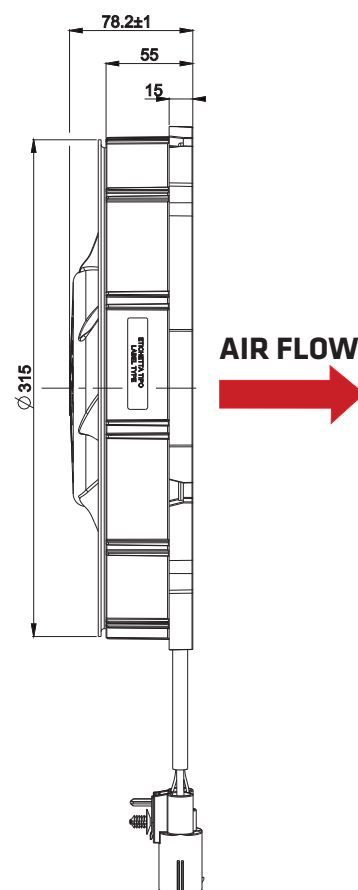
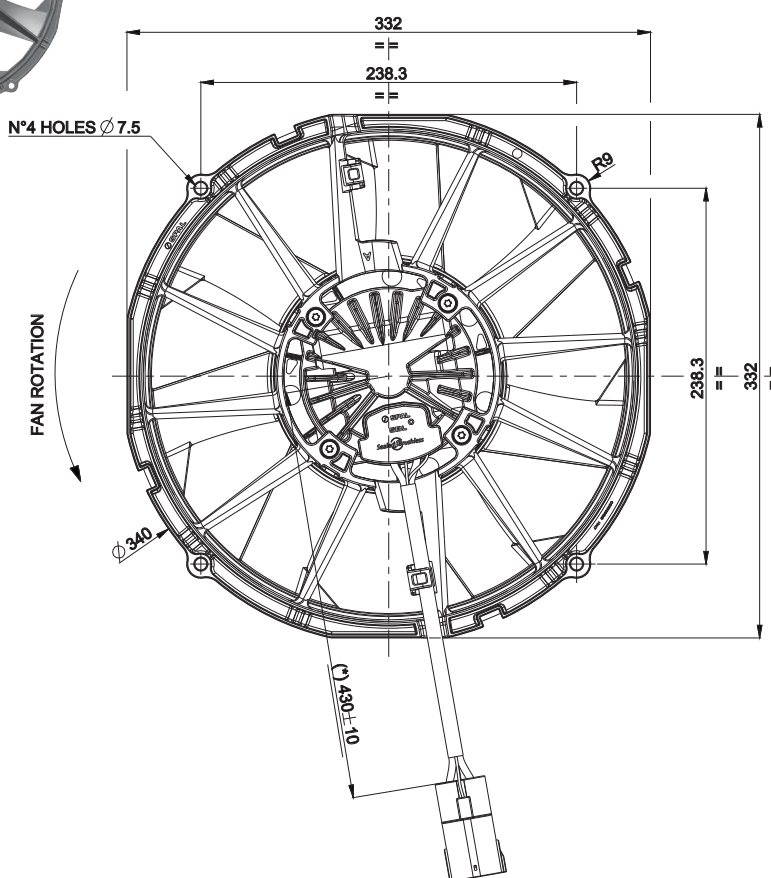
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 305 mm  
Ø 12"

### VA113-BBL504P/N-94A

#### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



#### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

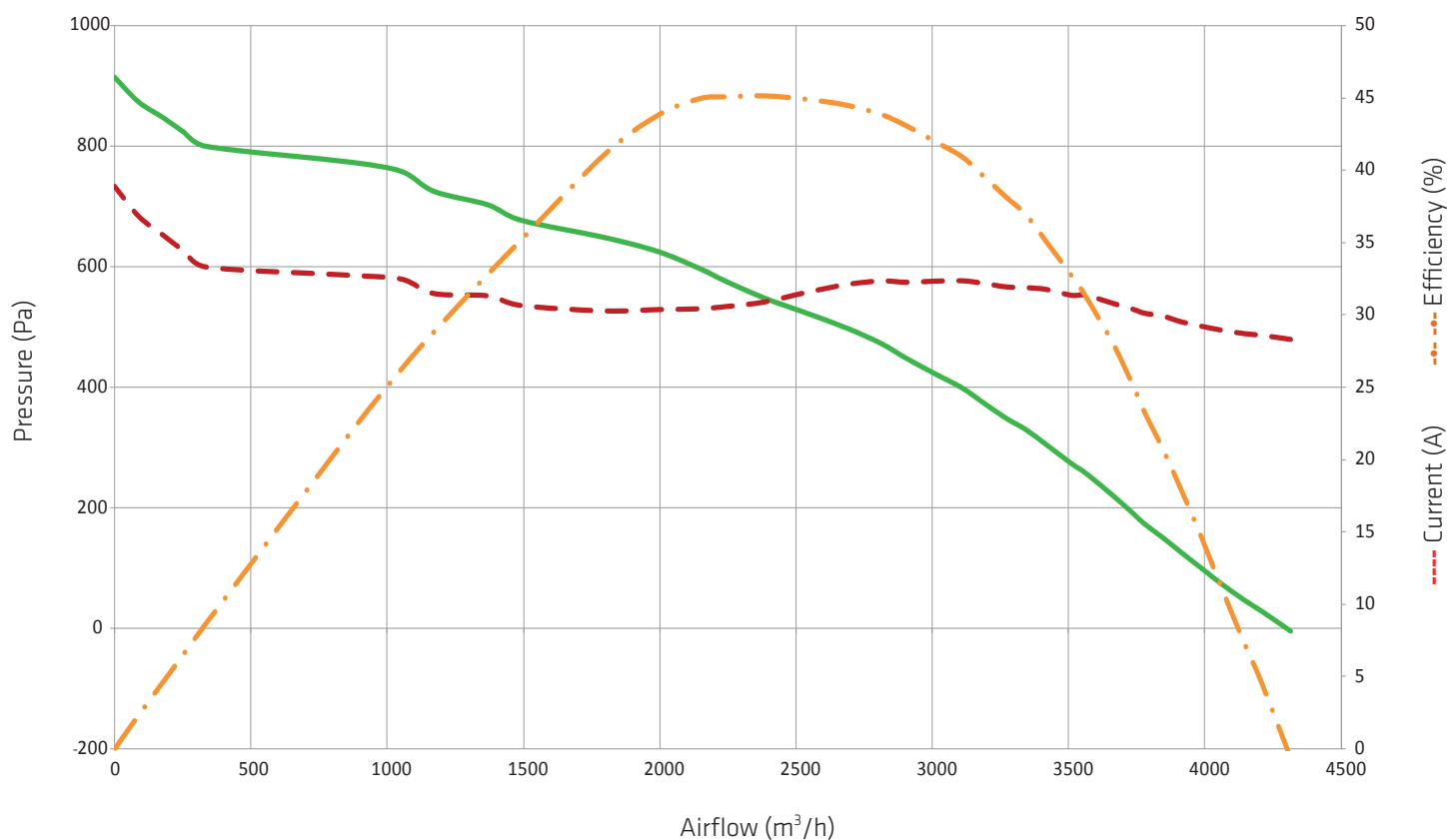
	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7158-3035	7158-3035	7158-3030-50	7158-3030-50
	Pin p/n	7114-3250	7114-3250	7114-4102-02	7114-4102-02
	Section [mm²]	6.0	6.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA113-BBL504P/N-94A

Ø 305 mm  
Ø 12"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

<b>Max fan speed</b>	rpm	4750
<b>Min fan speed</b>	rpm	1200
<b>Sound pressure level</b>	dBA	85.6 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.6
<b>Operating supply voltage range</b>	V	16.0 .. 32.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	26.0 .. 32.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +110
<b>Speed derating threshold</b>	°C	+65 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	10
<b>Load dump protection (Pulse 5b)</b>	V	65 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

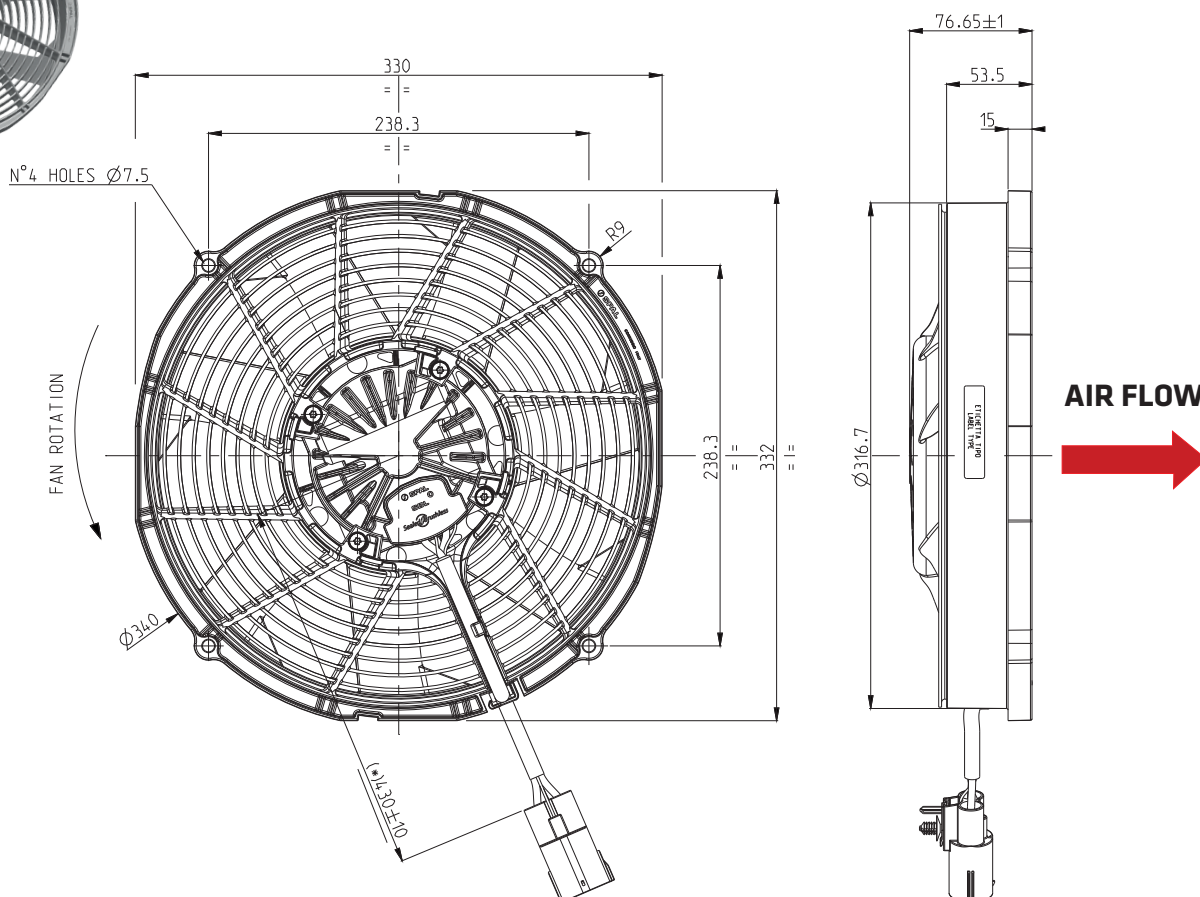
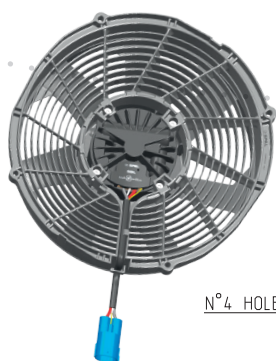
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 305 mm  
Ø 12"

### VA90-BBL338P/N-94A

#### Technical Data

- All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm
- Motors certified **IP6K9K** and **IP68**



#### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

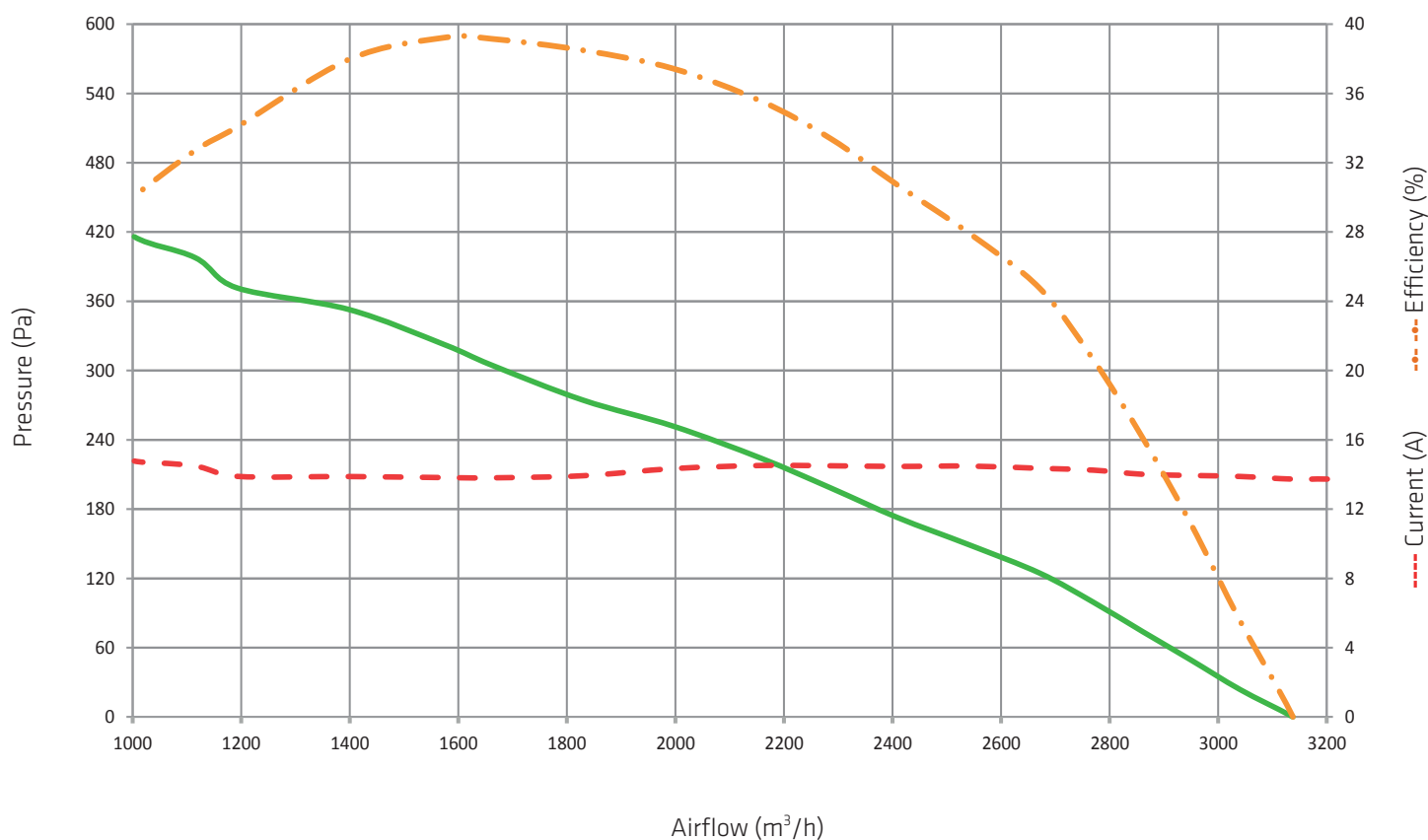
**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA90-BBL338P/N-94A

Ø 305 mm

Ø 12"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	3650
Min fan speed	rpm	900
Sound pressure level	dBA	75.6 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.4
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +95
Speed derating threshold	°C	+85 (*)
Storage temperature range	°C	-40 .. +120
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	15
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

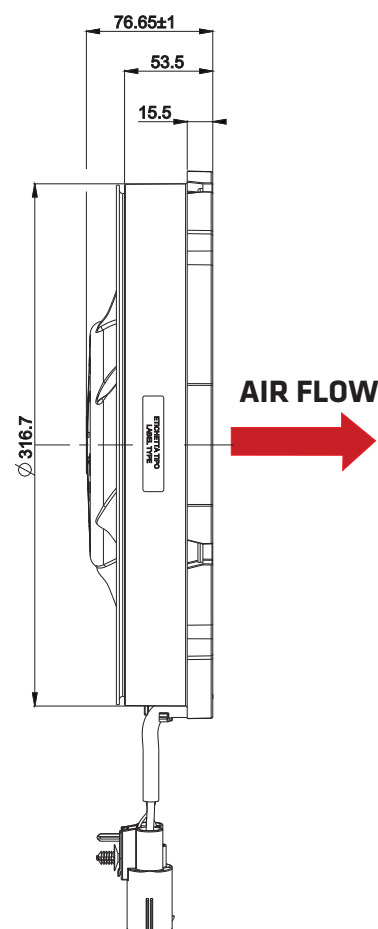
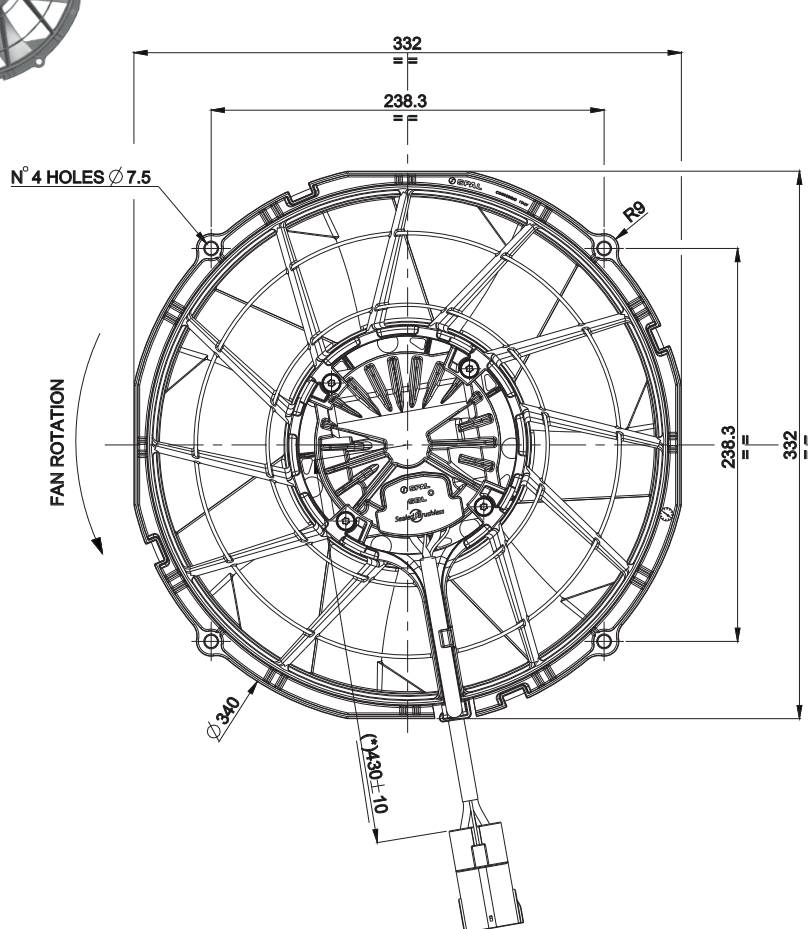
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 305 mm  
Ø 12"

### VA89-BBL338P/N-94A

#### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



#### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

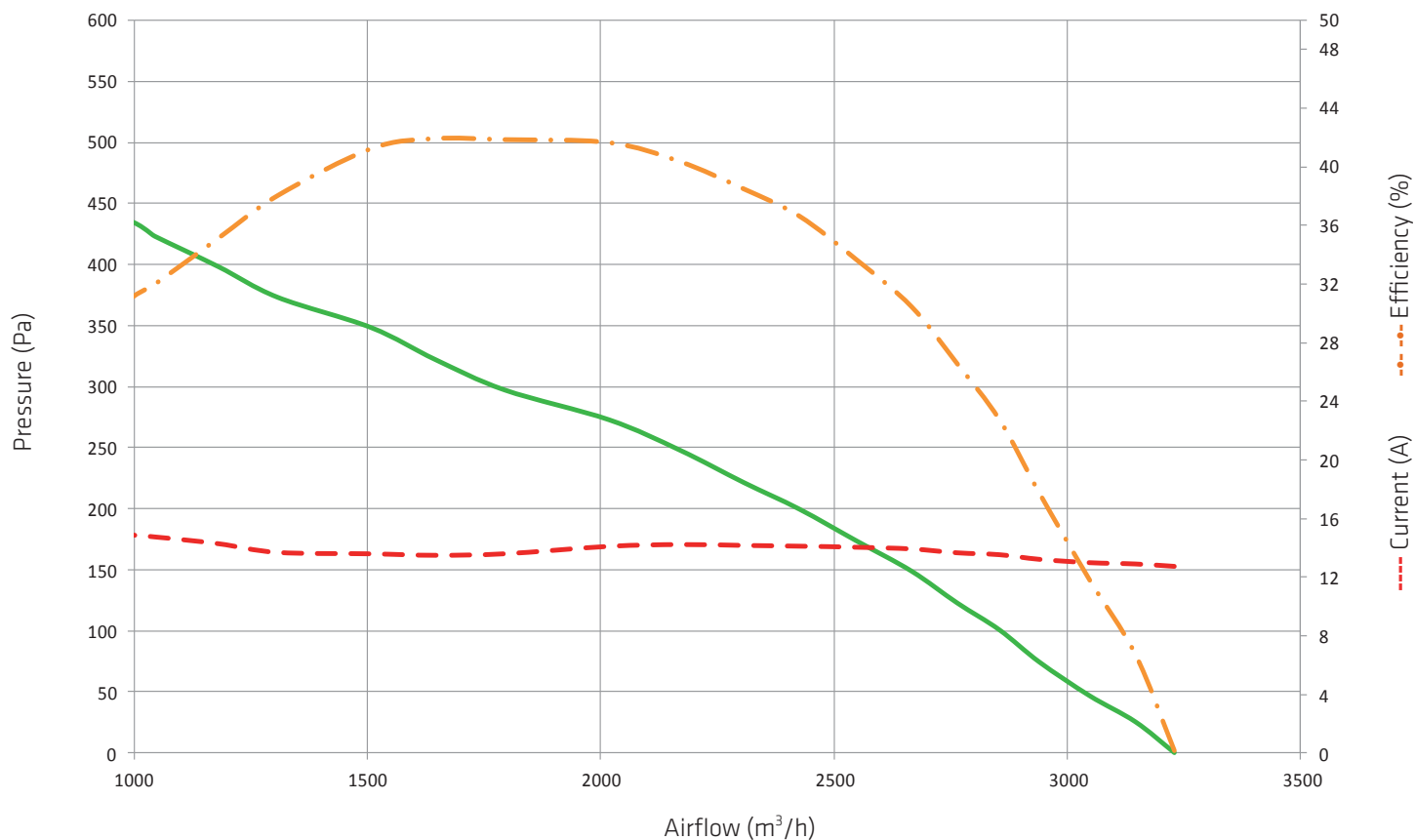
	Identification	+D	-D	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA89-BBL338P/N-94A

Ø 305 mm  
Ø 12"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

<b>Max fan speed</b>	rpm	3650
<b>Min fan speed</b>	rpm	900
<b>Sound pressure level</b>	dBA	78 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.20
<b>Operating supply voltage range</b>	V	16.0 .. 32.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	26.0 .. 32.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +95
<b>Speed derating threshold</b>	°C	+85 (*)
<b>Storage temperature range</b>	°C	-40 .. +120
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Time from 0 rpm to max speed</b>	s	15
<b>Load dump protection (Pulse 5b)</b>	V	65 - Pulse peak voltage (Us *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

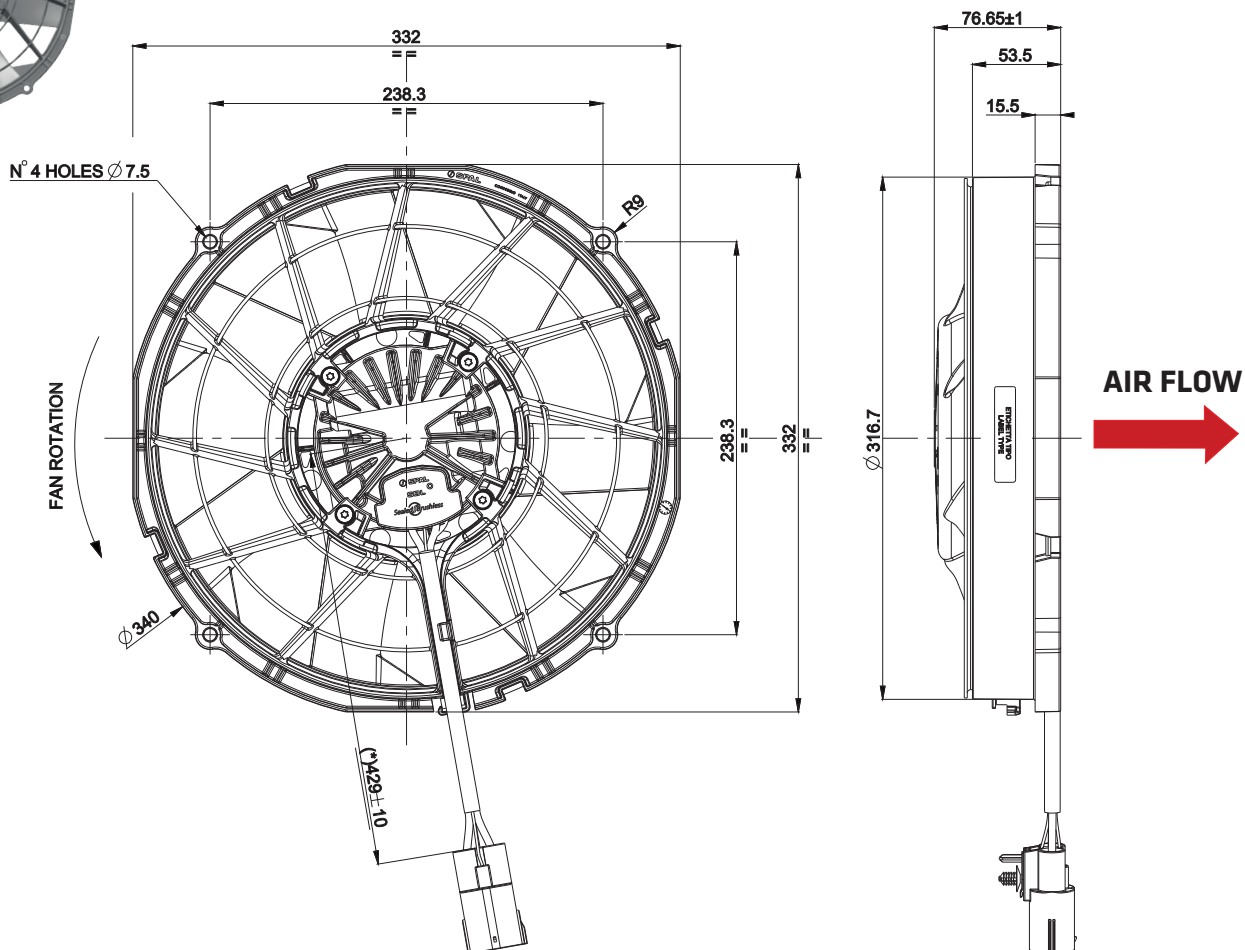
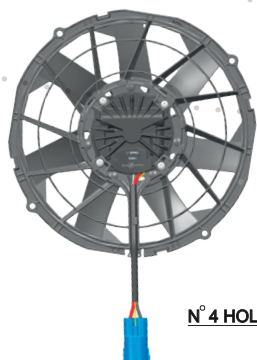
Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

Ø 305 mm  
Ø 12"

### VA89-BBL328P/N-94A

#### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



#### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

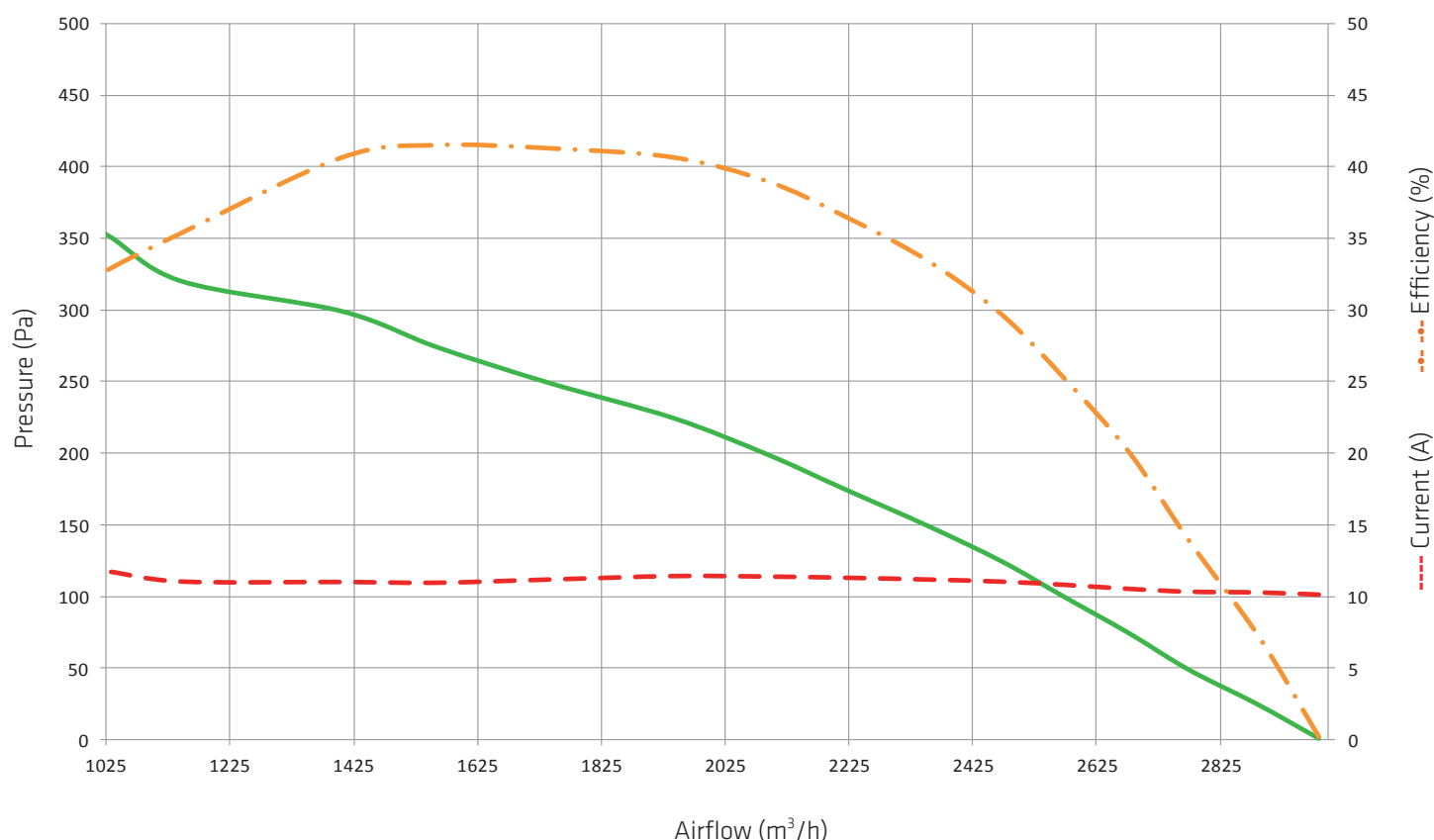
<p>4. WHITE SECT. 0.5 mm<sup>2</sup></p> <p>1. RED SECT. 4.0 mm<sup>2</sup></p> <p>2. BLACK SECT. 4.0 mm<sup>2</sup></p> <p>3. YELLOW SECT. 0.5 mm<sup>2</sup></p>	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm <sup>2</sup> ]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA89-BBL328P/N-94A

Ø 305 mm  
Ø 12"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	3400
Min fan speed	rpm	850
Sound pressure level	dBA	75.7 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.30
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +110
Speed derating threshold	°C	+95 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	11
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

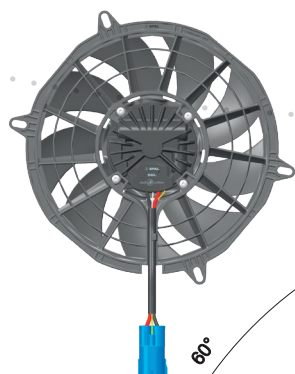
Ø 280 mm  
Ø 11"

**VA99-BBL324P/N-101A/SH**

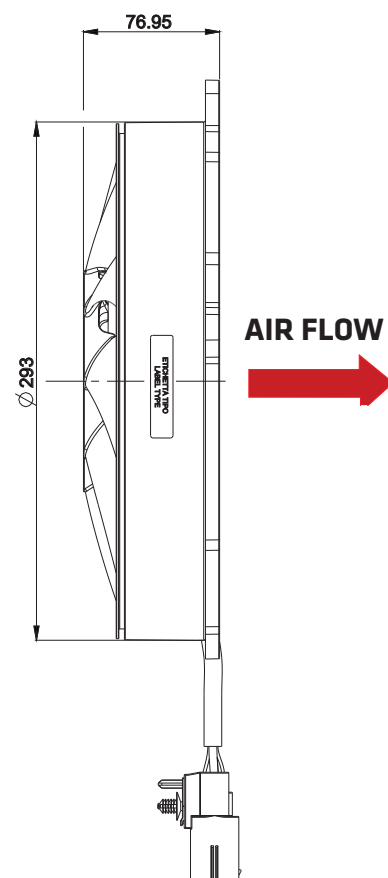
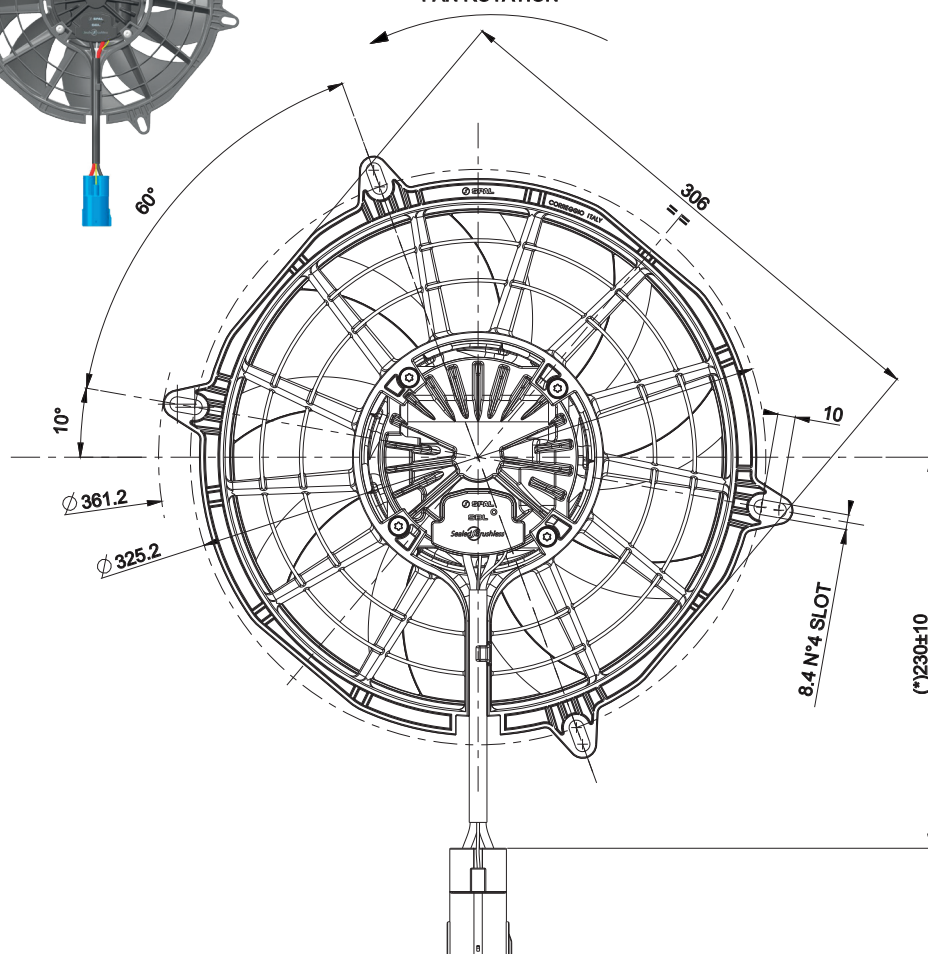
### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm

• Motors certified **IP6K9K** and **IP68**



FAN ROTATION



**Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90**

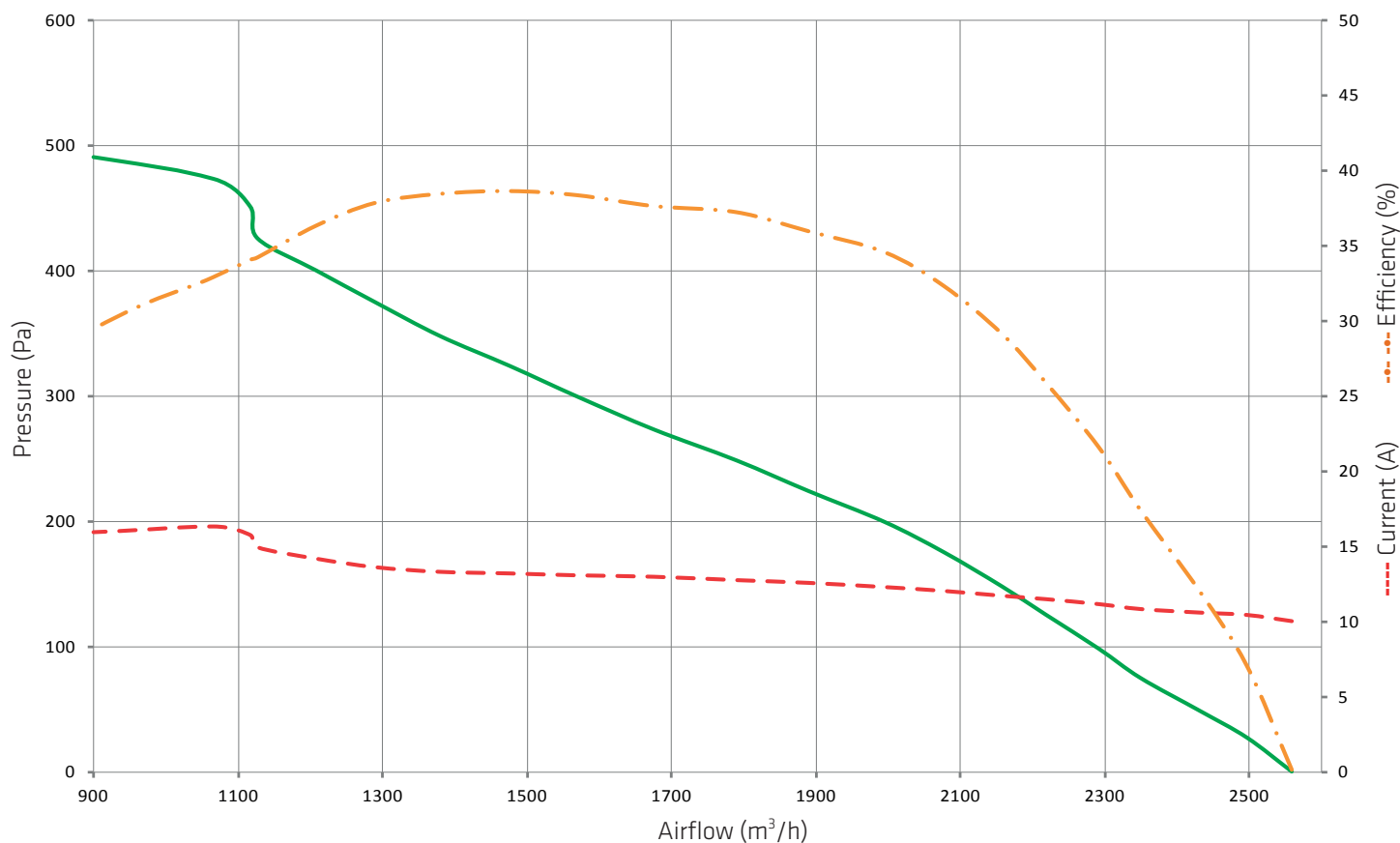
	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA99-BBL324P/N-101A/SH

Ø 280 mm  
Ø 11"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	4000
Min fan speed	rpm	1000
Sound pressure level	dBA	74.8 at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.0
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +95
Speed derating threshold	°C	+85 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	14
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

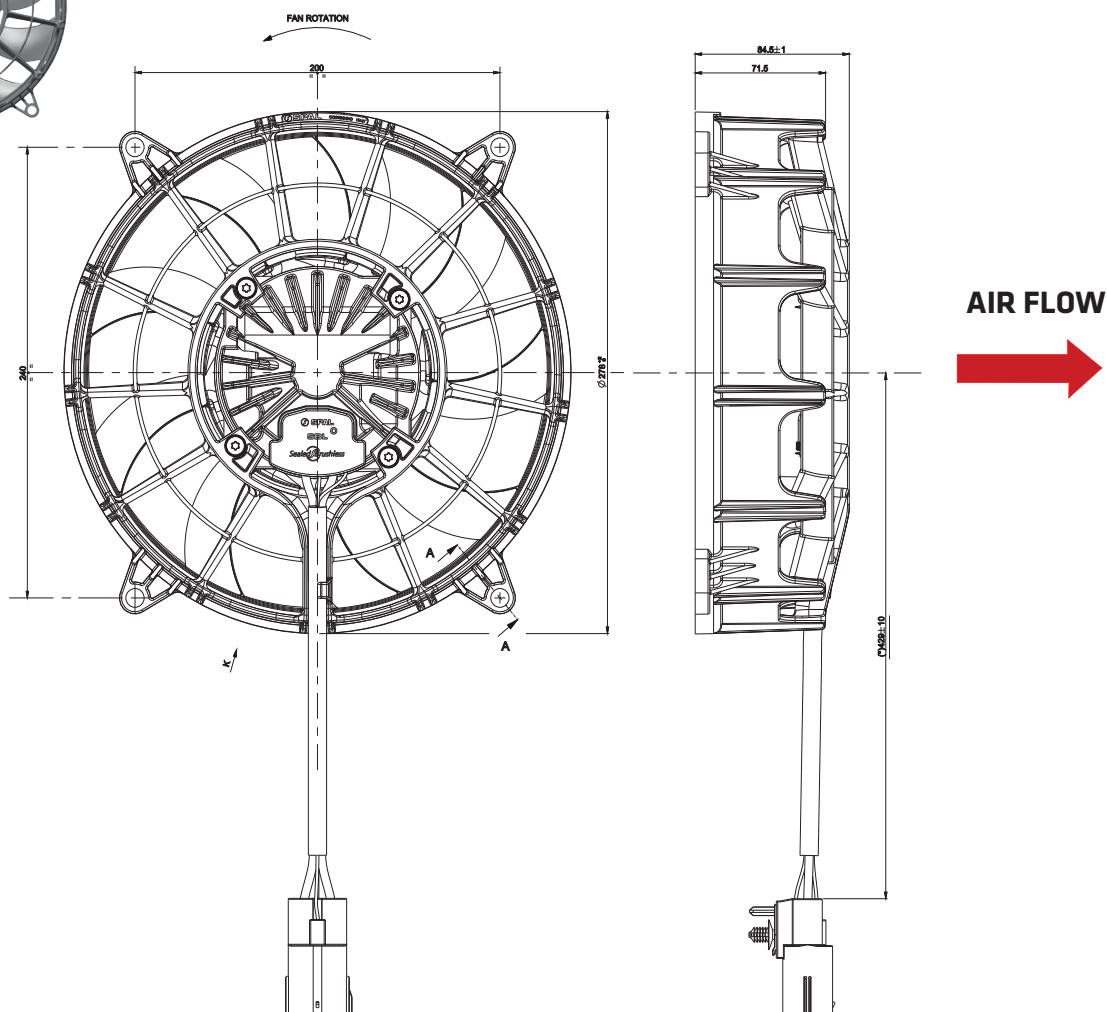
Ø 255 mm  
Ø 10"

**VA109-BBL330P/N-109A/SH**



### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



**Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90**

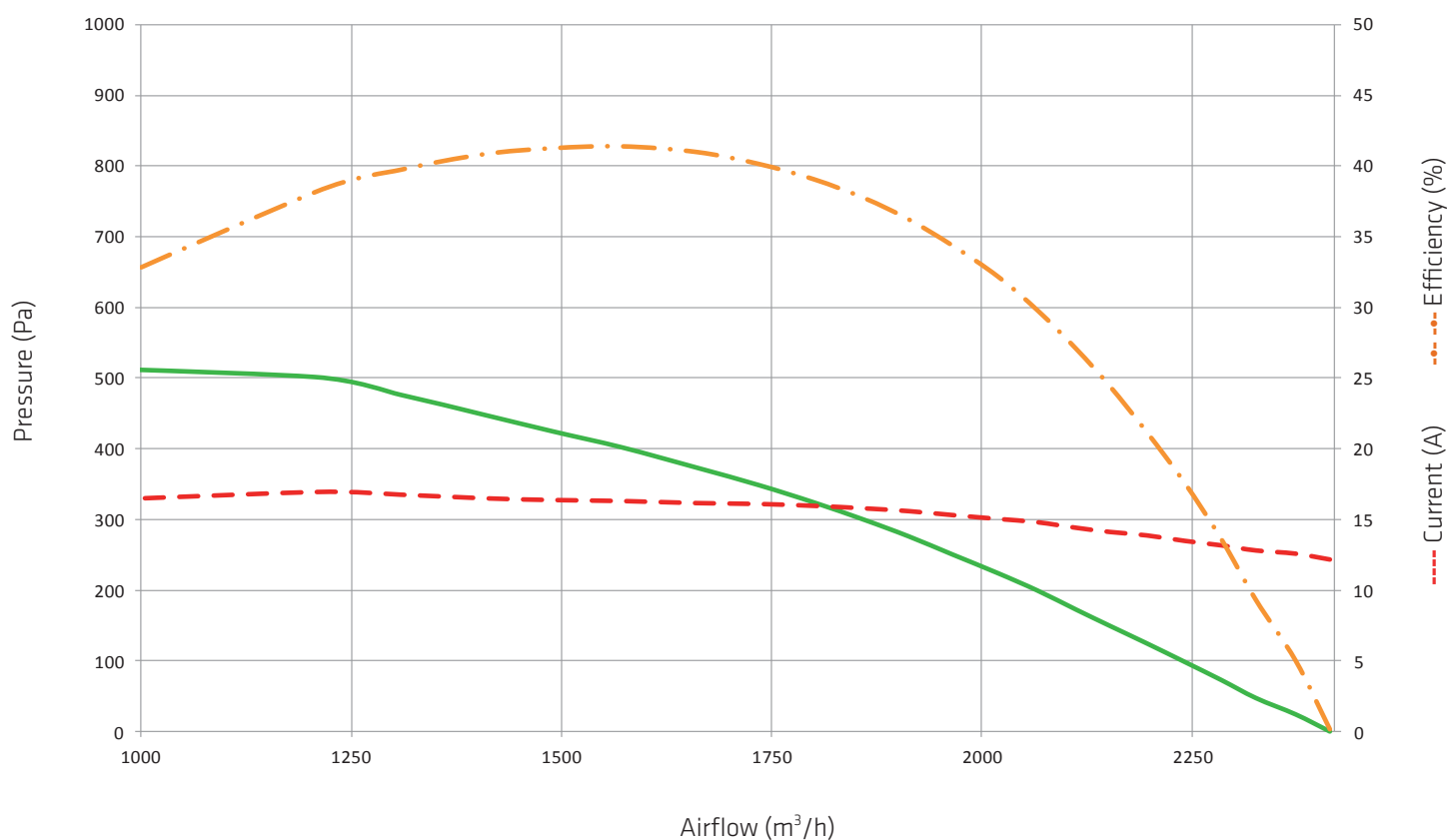
<p>4. WHITE SECT. 0.5 mm<sup>2</sup></p> <p>1. RED SECT. 4.0 mm<sup>2</sup></p> <p>2. BLACK SECT. 4.0 mm<sup>2</sup></p> <p>3. YELLOW SECT. 0.5 mm<sup>2</sup></p>	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm <sup>2</sup> ]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## VA109-BBL330P/N-109A/SH

Ø 255 mm  
Ø 10"

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

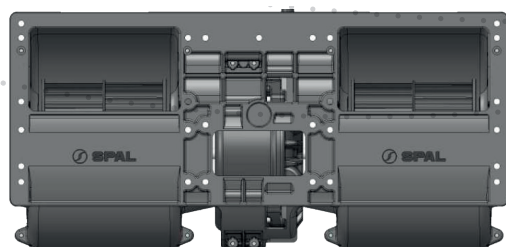
## Features

Max fan speed	rpm	4300
Min fan speed	rpm	1100
Sound pressure level	dBA	78 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	2.0
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +95
Speed derating threshold	°C	+85 (*)
Storage temperature range	°C	-40 .. +125
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	14
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (U <sub>S</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

020

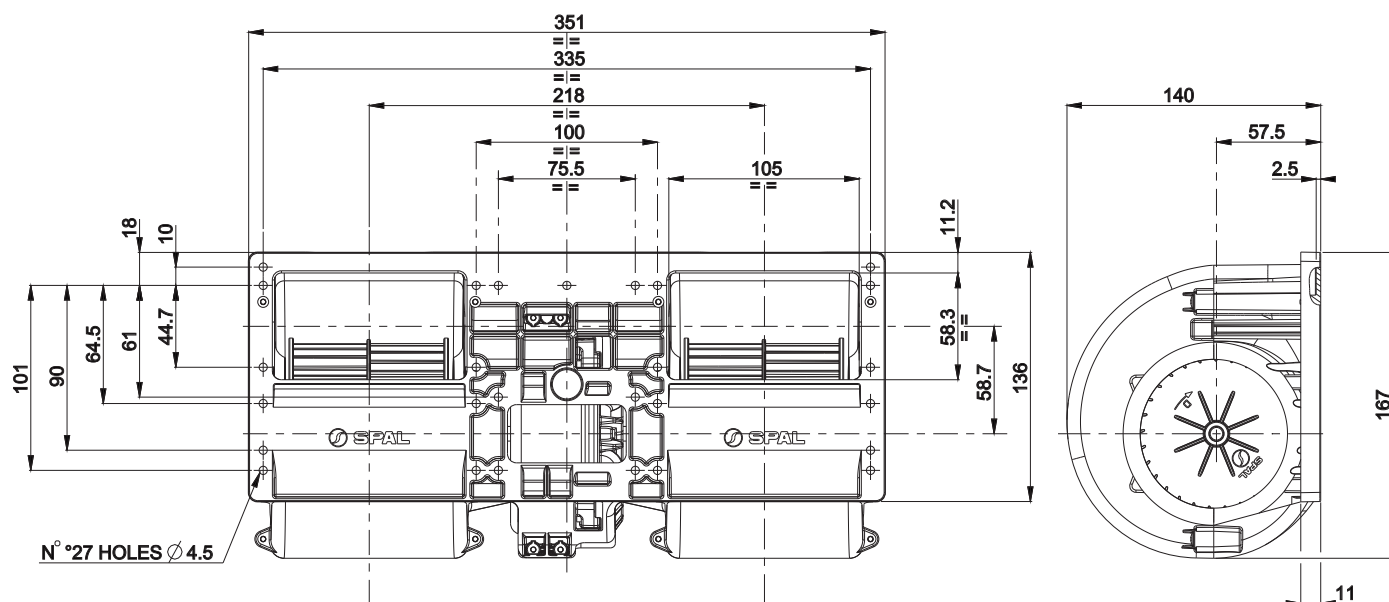
020-BBL331P/N-95



### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm

Motors certified **IP6K9K** and **IP68**

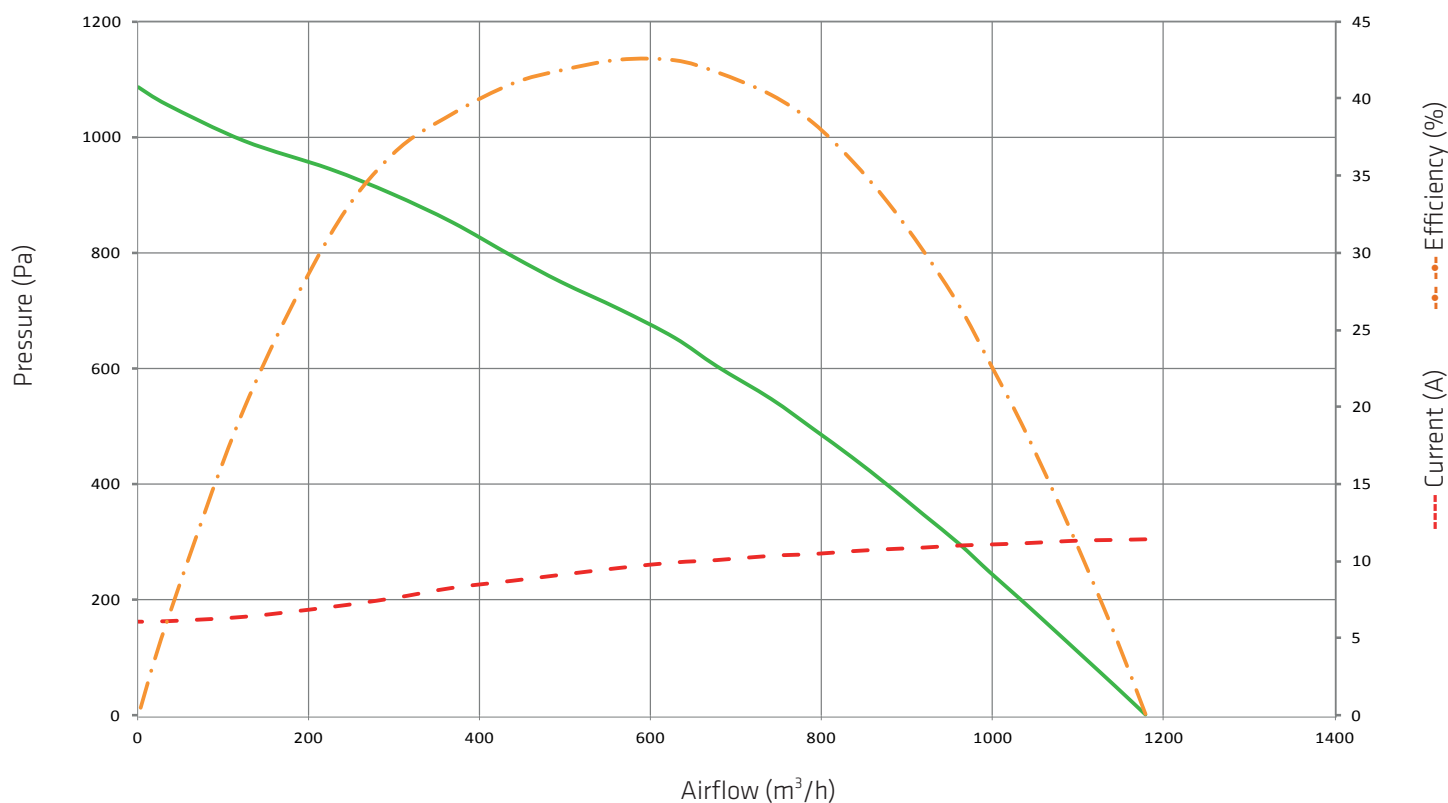


### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+	-	A	PWM* / E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## Performance Curve



Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

### Features

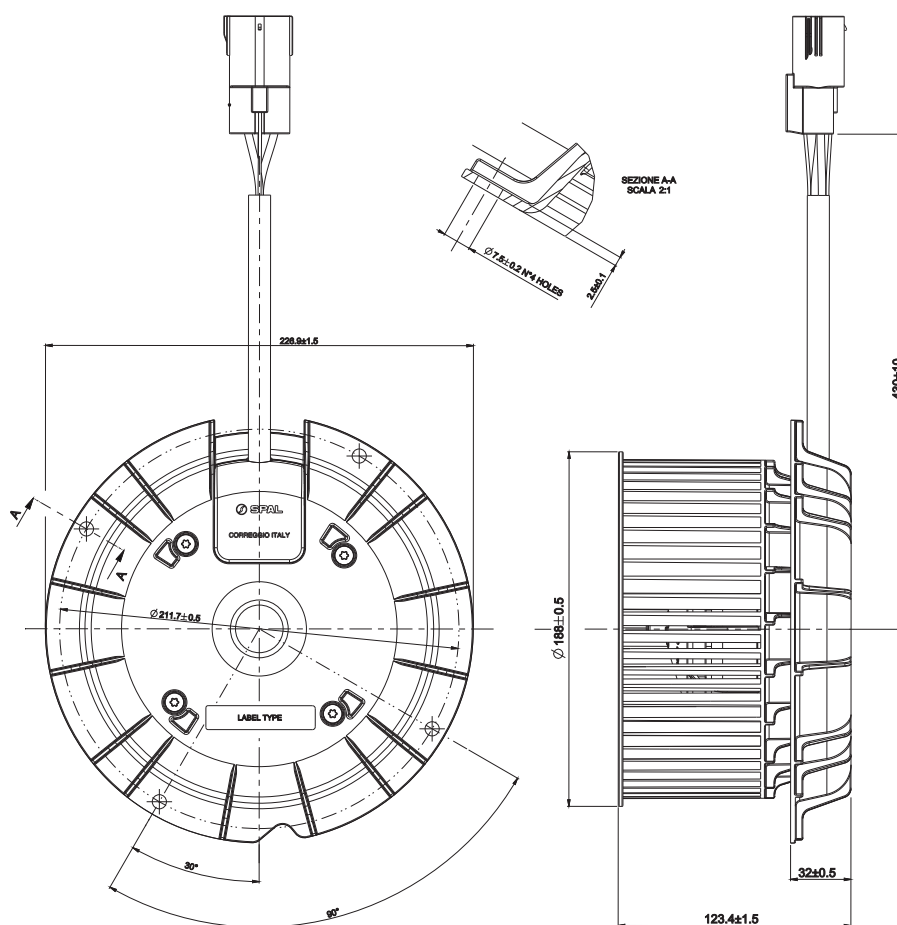
<b>Max fan speed</b>	rpm	3574
<b>Min fan speed</b>	rpm	887
<b>Sound pressure level</b>	dBA	72.8 - at 1 m ± 0.005 m from the fan module- lateral side
<b>Weight</b>	Kg	2.3
<b>Operating supply voltage range</b>	V	16.0 .. 32.0 at the Drive Connector
<b>Supply voltage to reach max speed</b>	V	26.0 .. 32.0 at the Drive Connector
<b>Operating ambient temperature range</b>	°C	-40 .. +95
<b>Speed derating threshold</b>	°C	+85 (*)
<b>Storage temperature range</b>	°C	-40 .. +125
<b>Lifetime</b>	h	up to 40000 hours depending on mission profile
<b>Load dump protection (Pulse 5b)</b>	V	65 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
<b>Reverse polarity protection</b>		ISO 16750-1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.

### BBL354P-120S

#### Technical Data

All dimensions are expressed in mm. Use M6 screws for fixing – nominal tightening torque 4 Nm  
Motors certified **IP6K9K** and **IP68**



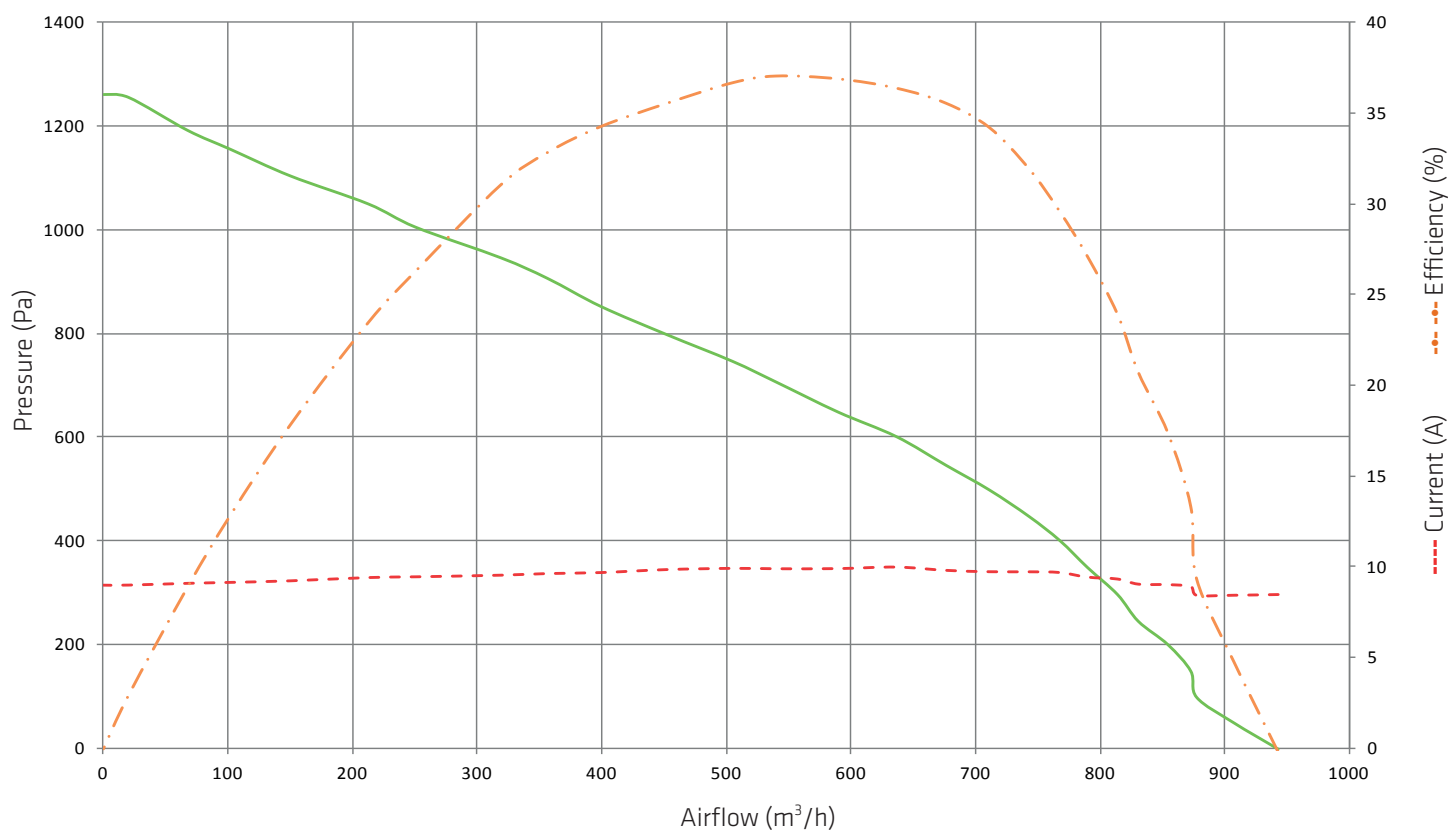
#### Connector: YAZAKI HYBRID (USCAR-2 compliant) - Part number: 7282-8497-90

	Identification	+	-	A	PWM*/E*
	Pin number	1	2	3	4
	Wire Color	RED	BLACK	YELLOW	WHITE
	Sealing p/n	7157-3582-90	7157-3582-90	7158-3030-50	7158-3030-50
	Pin p/n	7114-3251	7114-3251	7114-4102-02	7114-4102-02
	Section [mm²]	4.0	4.0	0.5	0.5

**NOTE: YAZAKI connector counterpart available upon request (see page 63)**

## BBL354P-120S

## Performance Curve

Pressure: 1Pa=0.004 inH<sub>2</sub>O

Airflow: 1m³/h=0.59 cfm

## Features

Max fan speed	rpm	1850
Min fan speed	rpm	800
Sound pressure level	dBA	73 - at 1 m ± 0.005 m from the fan module- lateral side
Weight	Kg	1.9
Operating supply voltage range	V	16.0 .. 32.0 at the Drive Connector
Supply voltage to reach max speed	V	26.0 .. 32.0 at the Drive Connector
Operating ambient temperature range	°C	-40 .. +95
Speed derating threshold	°C	+85 (*)
Storage temperature range	°C	-40 .. +120
Lifetime	h	up to 40000 hours depending on mission profile
Time from 0 rpm to max speed	s	5 (0 to 1900 rpm)
Load dump protection (Pulse 5b)	V	65 - Pulse peak voltage (U <sub>s</sub> *) - ISO16750-2:2010
Reverse polarity protection		ISO 16750 - 1 functional status class C - device fully functional after correcting the polarity

Notes (\*): Few minutes ambient temperature transients do not engage the derating owing to the thermal inertia of the system. Overloads may anticipate derating.





**SPAL**  
AUTOMOTIVE

## DRIVE CONTROL MODES





## PROTECTIONS




Built-in drive protections:

1. Drive blocked
2. Drive overheated
3. Drive overloaded
4. Under voltage
5. Over voltage
6. Over current
7. Internal Drive failure

## MOTOR CONTROL INTERFACE

8 different interface control strategies for flexible and smart motor control

Mode description	Mode	+D	-D	PWM* / E*	A	Pins
On / off to minus	1	+		-	+	4
On / off to plus	2		-	-	+	4
On / off with enable low	3	+	-		+	4
Analog control 1	4	+		-	analog	4
Analog control 2	5		-	-	analog	4
Analog control with enable low	6	+	-		analog	4
Digital control	7	+	-	PWM	n.c.	3
Mixed analog / digital control	8	+	-	PWM	analog	4

- +D : Drive positive supply  
 -D : Drive negative supply  
 PWM\* / E\* : PWM input / low active enable input  
 A : analog input  
 + : connected to plus  
 - : connected to minus  
 analog : analog voltage signal  
 PWM : PWM signal  
 n. c. : not connected  
 : switch of the Drive positive supply to plus  
 : switch of the Drive negative supply to minus / GND  
 : switch active low enable input to minus / GND

## INTERFACE MODE 1: ON / OFF TO MINUS

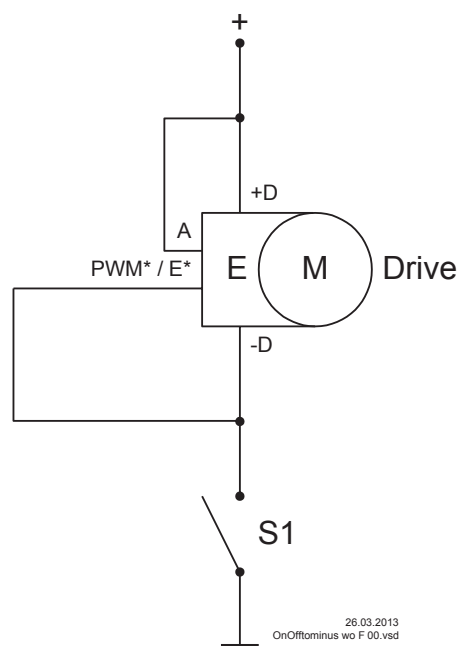
To realize the mode On / off to minus with the Drive Interface for Catalog Product 12 V it is necessary to put

- A to +D and
- PWM\* / E\* to -D.

When the switch S1 is switched on the Drive goes after the initialization of the electronics to full speed.

This mode can be used if the CCU which controls the Drive has limited capabilities or does not even exist. The Drive is just switched on and off via any power switch like a relay, MOS FET, or even just a switch.

The appropriate current rating for this “switch” has to be dimensioned according to the current consumption of the Drive.



## INTERFACE MODE 2: ON / OFF TO PLUS

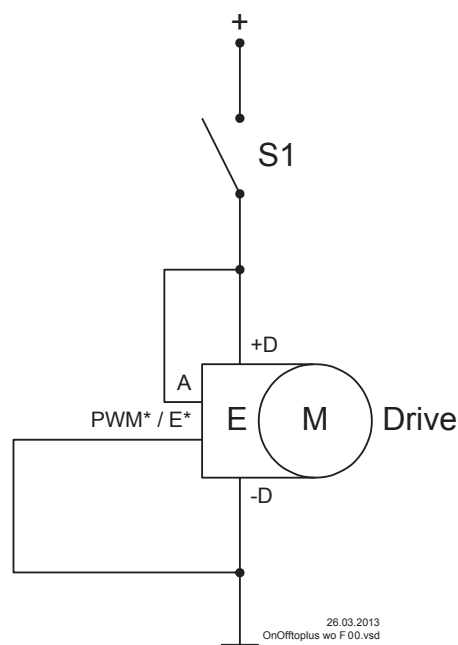
To realize the mode On / off to plus with the Drive Interface for Catalog Product 12 V it is necessary to put

- A to +D and
- PWM\* / E\* to -D.

When the switch S1 is switched on the Drive goes after the initialization of the electronics to full speed.

This mode can be used if the CCU which controls the Drive has limited capabilities or does not even exist. The Drive is just switched on and off via any power switch like a relay, MOS FET, or even just a switch.

The appropriate current rating for this “switch” has to be dimensioned according to the current consumption of the Drive.

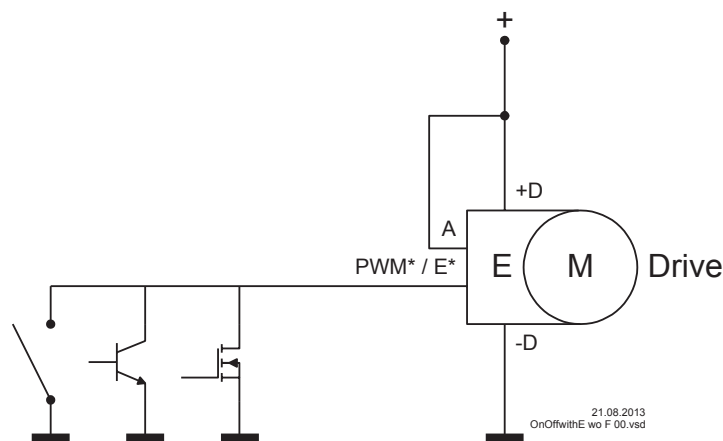


### INTERFACE MODE 3: ON / OFF WITH ENABLE LOW

To realize the mode On / off with enable low with the Drive Interface for Catalog Product 12 V it is necessary

- A to +D and
- to use PWM\* / E\* as an low active enable.

In mode 3 the Drive can stay always on supply voltage and is controlled by a low current enable input which can be driven by simple low cost low side signal driver in the CCU. When the enable input PWM\* / E\* goes to high, the Drive goes after a short time into the quiescent current mode. When the enable pin PWM\* / E\* is driven low, the Drive goes to full speed after the initialization of the electronics. This mode can be used if the CCU which controls the Drive has limited capabilities or does not even exist. The appropriate sink current rating of the driver for the enable pin PWM\* / E\* has to be dimensioned according to the current consumption of the pin PWM\* / E\*. The circuit structure to drive the pin PWM\* / E\* can be any active low "open collector" Typical circuitry.

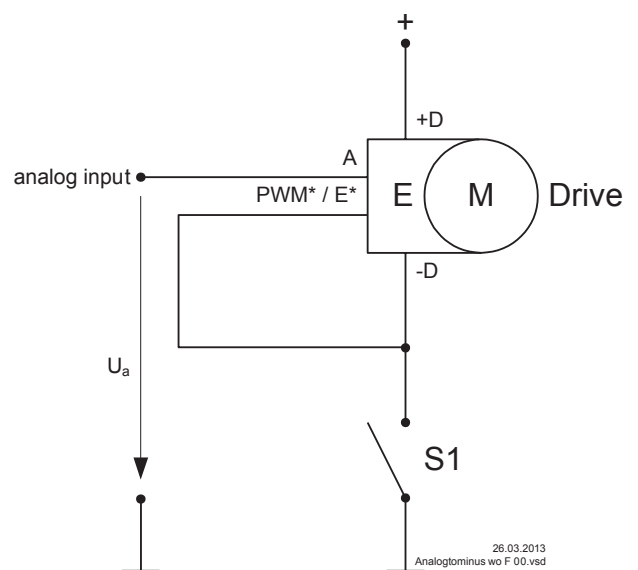


### INTERFACE MODE 4: ANALOG CONTROL 1

To realize the mode Analog control 1 with the Drive Interface for Catalog Product 12 V it is necessary

- to use A as an analog input and
- to put PWM\* / E\* to -D.

When the switch S1 is switched on the Drive goes after the initialization of the electronics to the speed requested by the analog input A. The appropriate current rating for this "switch" has to be dimensioned according to the current consumption of the Drive.



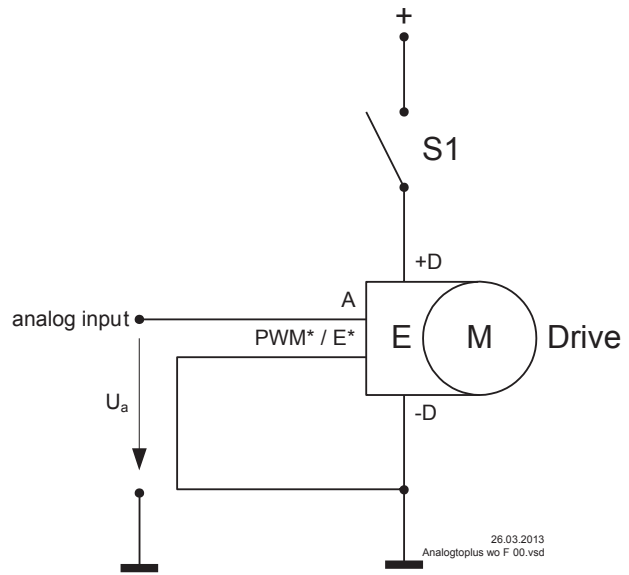
## INTERFACE MODE 5: ANALOG CONTROL 2

To realize the mode Analog control 2 with the Drive Interface for Catalog Product 12 V it is necessary

- to use A as an analog input and
- to put PWM\* / E\* to -D.

When the switch S1 is switched on the Drive goes after the initialization of the electronics to the speed requested by the analog input A.

The appropriate current rating for this “switch” has to be dimensioned according to the current consumption of the Drive.



## INTERFACE MODE 6: ANALOG CONTROL WITH ENABLE LOW

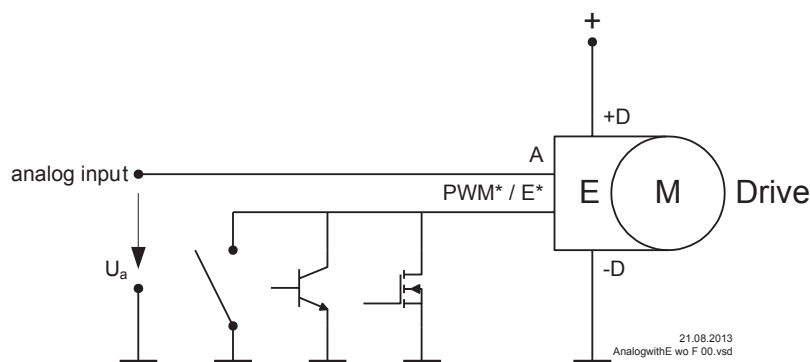
To realize the mode Analog control with enable low with the Drive Interface for Catalog Product 12 V it is necessary

- to use A as an analog input and
- to use PWM\* / E\* as a low active enable.

In mode 6 the Drive can stay always on supply voltage and is controlled by a low current enable input which can be driven by simple low cost low side signal driver in the CCU. When the enable input PWM\* / E\* goes to high, the Drive goes after a short time into the quiescent current mode.

When the enable pin PWM\* / E\* is driven low, the Drive goes to the speed requested by the analog input A after the initialization of the electronics. The appropriate sink current rating of the driver for the enable pin PWM\* / E\* has to be dimensioned according to the current consumption of the pin PWM\* / E\*.

The circuit structure to drive the pin PWM\* / E\* can be any active low “open collector” Typical circuitry In this operating mode the supply voltage plus is usually connected permanently. To run the Drive first the pin PWM\* / E\* has to be connected to supply voltage minus and afterwards the Drive speed can be then controlled with an analog voltage on the pin A.



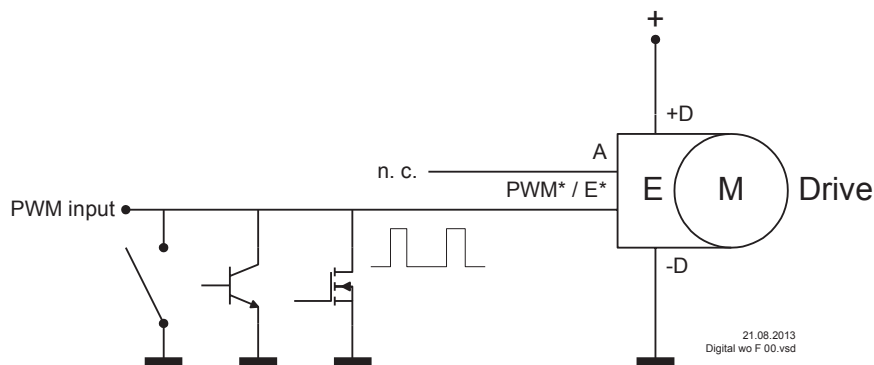
## INTERFACE MODE 7: DIGITAL CONTROL

To realize the mode Digital control with the Drive Interface for Catalog Product 12 V it is necessary

- to apply a PWM signal on the pin PWM\* / E\*.

In mode 7 the Drive can stay always on supply voltage and is controlled by a low current PWM and enable PWM\* / E\* input which can be driven by simple low cost low side signal driver in the CCU. When the enable input PWM\* / E\* goes to high, the Drive goes after a short time into the quiescent current mode. When the enable pin PWM\* / E\* is driven with PWM, the Drive goes to the speed requested by the duty cycle after the initialization of the electronics. The appropriate sink current rating of the driver for the enable pin PWM\* / E\* has to be dimensioned according to the current consumption of the pin PWM\* / E\*.

The circuit structure to drive the pin PWM\* / E\* can be any active low “open collector” Typical circuitry In this operating mode the supply voltage plus is usually connected permanently. To run the Drive on the pin PWM\* / E\* a PWM signal has to be applied and with the duty cycle of the PWM signal the Drive speed can be then controlled.

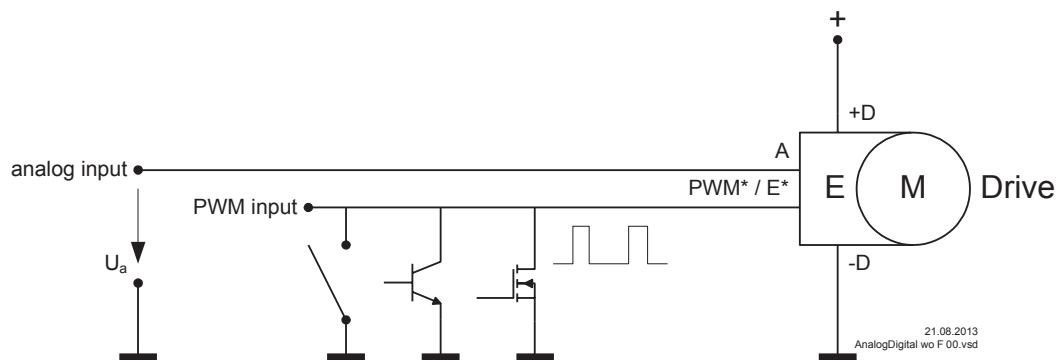


## INTERFACE MODE 8: MIXED ANALOG / DIGITAL CONTROL

To realize the mode Mixed analog / digital control with the Drive Interface for Catalog Product 12 V it is necessary

- to use A as an analog input and
- to apply a PWM signal on the pin PWM\* / E\*.

In mode 8 the Drive can stay always on supply voltage and is controlled by a low current PWM and enable PWM\* / E\* input which can be driven by simple low cost low side signal driver in the CCU. When the enable input PWM\* / E\* goes to high, the Drive goes after a short time into the quiescent current mode. When the enable pin PWM\* / E\* is driven low (switched to supply voltage minus), the Drive goes to the speed requested by the analog input A after the initialization of the electronics (if the electronics is not already activated). When the enable pin PWM\* / E\* is driven with PWM, the Drive goes to the speed requested by the duty cycle after the initialization of the electronics (if the electronics is not already activated). The appropriate sink current rating of the driver for the enable pin PWM\* / E\* has to be dimensioned according to the current consumption of the pin PWM\* / E\*. The circuit structure to drive the pin PWM\* / E\* can be any active low “open collector” Typical circuitry.



In this operating mode the supply voltage plus is usually connected permanently. To run the Drive on the pin PWM\* / E\* a PWM signal has to be applied and with the duty cycle of the PWM signal the Drive speed can be then controlled. If the pin PWM\* / E\* is switched to supply voltage minus the Drive speed can be then controlled with an analog voltage on the pin A.

So a mixed control with either digital or analog input is possible. The priority has the digital PWM signal.

## FUSE PROTECTION

An automotive fuse according ISO8820 part 3 must be applied in the vehicle/system wire harness. Depending on the application of the fan, it is customer responsibility to define and verify the correct fuse value (due to the length of the vehicle cable harness, cross section of the power wires, fuse type).

## POWER SUPPLY RESIDUAL RIPPLE

The maximum acceptable value of power supply rms ripple for the Drive is 1 %. In case of application with high residual ripple values, please contact SPAL in order to find the suitable solution for your specific requirements.

## STANDARDS AND DIRECTIVES

The product complies with the following standard / directives

Standard Code	Description
72/245/EC and updates	Automotive EMC directive
ECE Reg. 10-03 and updates	Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility
2002/95/EC RoHS	Restriction of Hazardous Substances Directive
2000/53/EC and updates	End-of Life Vehicle 2000/53/EC

## SEALING

Motors certified **IP6K9K** and **IP68**



**SPAL**  
AUTOMOTIVE

ACCESSORIES

# SOLUTIONS FOR EVER GROWING COOLING NEEDS

## ACCESSORIES ON REQUEST

**SPAL p/n 30130709** – Additional protection guard for VA89A and VA113 shroud

30130709

Mounting example on VA89A - VA113



# BRUSHLESS MOTOR FANS AND BLOWERS

OUR CLIENTS ARE OUR BEST REFERENCE  
WE WORK WITH THE BEST OEM MANUFACTURES

## YAZAKI CONNECTOR COUNTERPART

**SPAL p/n 30130628** Complet Connector Counterpart Kit, for 12V and 24V (available upon request).

The Kit includes:

Corresponding Yazaki component PN	Notes	Qty
<b>7283-8497-90</b>	Male Connector	1
<b>7158-3032-60</b>	Seal gasket 1,5 [mm]	1
<b>7116-3251</b>	Female Fast-on terminal	2
<b>7157-3582-90</b>	Seal gasket Ø 2,5-3,5 [mm] for cables	2
<b>7116-3250</b>	Female Fast-on terminal	2
<b>7158-3035</b>	Seal gasket Ø 4-5 [mm] for cables	2
<b>7157-3581-80</b>	Seal gasket Ø 4,75-5,65 [mm] for cables	2
<b>7116-3285-02</b>	Female Fast-on terminal	2
<b>7158-3036-70</b>	Seal gasket Ø 5,5-6,5 [mm] for cables	2
<b>7116-4103-02</b>	Female Fast-on terminal	2
<b>7158-3031-90</b>	Seal gasket Ø 1,6-2,2 [mm] for cables	2
<b>7116-4102-02</b>	Female Fast-on terminal	2
<b>7158-3030-50</b>	Seal gasket Ø 1,2-1,7 [mm] for cables	2
<b>7147-8925-30</b>	Connector fixing hook	1

## Accreditation

- SPAL has TS16949 and ISO 9001 certification for quality system requirements for design, development, production, installation and servicing.
- SPAL's Environmental Management System is certified to UNI EN ISO14001:2004, and also meets the European Directive 2000/53/EC on end-of-life vehicles (ELV).





## Global Footprint

- The SPAL team has an international presence with subsidiaries in 6 countries around the world.
- The location of subsidiaries has been carefully co-ordinated to optimise the distribution and marketing of SPAL products with customer service and distribution centres based close to key customers.
- As manufacturers and the market are demanding products to perform increasingly complex tasks and requesting highly integrated systems, SPAL is prepared to invest in the future and rise to the challenge.
- SPAL is open to accessing new markets such as exhaust technology and vehicle-heating systems with plans to pursue these opportunities energetically in mature markets such as Europe and United States as well as in emerging regions such as China, India and Russia.

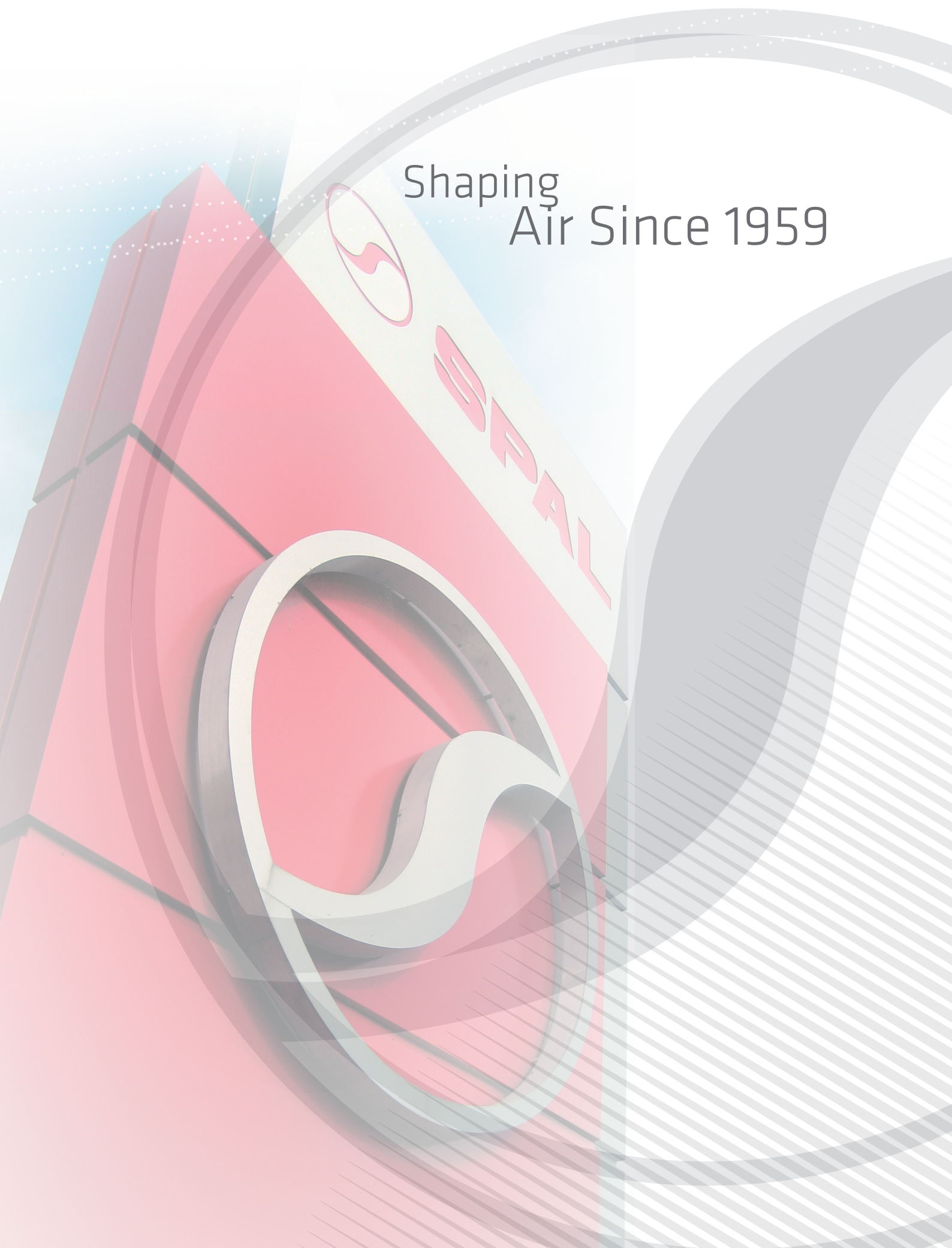


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- SPAL USA (Des Moines - Iowa - USA) US Subsidiary
- SPAL CHINA (Shanghai - China) Chinese Subsidiary
- SPAL Automotive UK (Worcester - UK) UK Subsidiary
- SPAL do Brazil (Sao Paulo - Brazil) Brazilian Subsidiary
- SPAL RUS (Saint-Petersburg - Russia) Russian Subsidiary
- SPAL Japan K.K. (Tokyo - Japan) Japanese Subsidiary
- PEE AAR Automotive Technologies (Delhi - India) Indian Distribution Facility
- Dedicated Area Managers covering Germany, Eastern Europe and Asian markets.



Shaping  
Air Since 1959





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This catalogue replaces all the previous one.

Our technical specification are purely indicative and might change without any previous notice.



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