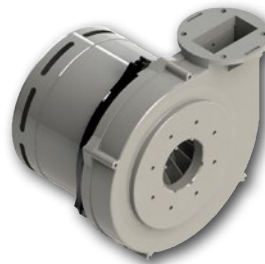
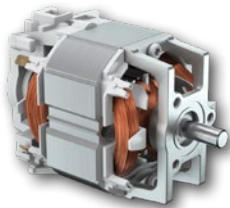
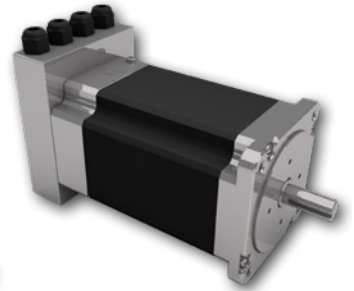
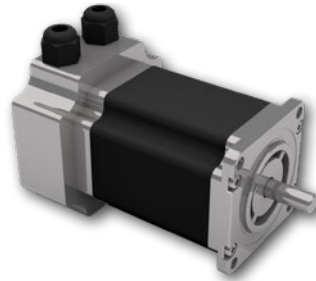
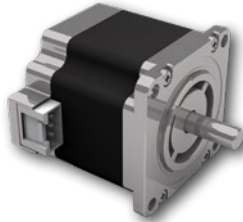
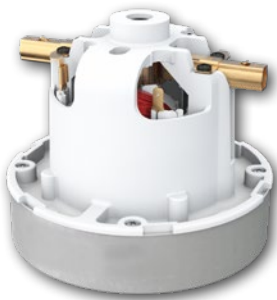




# MOTORS | BLOWERS | 2023





MAE, headquartered in Italy, is a customer-focused and quality-oriented company with 600 employees and three manufacturing sites in Italy, Czech Republic and Serbia.

"We design and manufacture advanced motion solutions that keep the world moving". MAE's product offering is based on a wide range of blowers and universal AC/DC, permanent magnet DC, stepper and brushless which can all be designed in combination with gearboxes, encoders and brakes. MAE solutions are designed and produced to achieve the highest

quality and performance levels, meeting longterm reliability, industry standards at an excellent price performance ratio.

MAE, together with Dunkermotoren, Haydon Kerk Pittman and Bison, is one of the four business units of AMETEK Advanced Motion Solutions (AMS); with 14 global operations, 3.200 employees and ten leading brands, AMS is the largest division of AMETEK Inc.

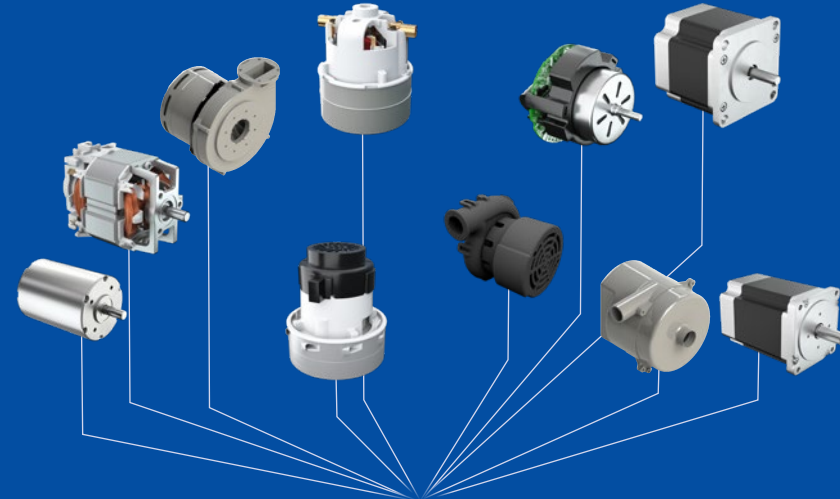
>> Our Products

» **Blowers**

- Universal AC/DC
- Brushless AC/DC

» **Motors**

- Universal AC/DC
- Stepper
- Brushless AC/DC
- Permanent Magnet DC



**BLOWERS**

**BLOWERS UNIVERSAL AC/DC**

» **Series BU and TU**

The MAE blower systems based on universal brushed motors are largely used in the cleaning market as well as various industrial applications. The MAE universal blower systems are available with different fan housing diameters, multiple fan stages, in thru flow or bypass design, for dry or wet applications, with tangential or peripheral air exhaust. Blowers can be designed for either main voltage AC or low voltage DC supply, standard motor insulation CL155 (F), superior lifetime operation, with the best in class energy efficiency system, according to the new ECO design standard. UL approval and double insulation upon request.

**BLOWERS BRUSHLESS AC/DC**

» **Series BB and TB**

The MAE range of electronically commutated brushless blowers provide extended service life with superior energy efficiency and high air-power density, and can be utilized in a wide variety of industrial and medical applications. MAE brushless blower models are available for either low voltage DC or AC single phase input, including units configured for universal AC input (100-240V 50/60Hz), while the high output 312 mm blower model can operate from 400 V 3-phase supply. Integrated control electronics make it possible to fully control the blower speed via an analogue or PWM command signal, with an on-board potentiometer used to set the required Max. speed. Tachometer and failure outputs can be provided to monitor the blower status, while customized mechanical and electrical configurations are also available upon request.

**MOTORS**

**UNIVERSAL AC/DC**

» **Series DU**

Developed in four frame sizes and different stack lengths, the MAE universal motors are highly versatile and utilized in a wide range of applications. This motor range is configured for either mains voltage AC or low voltage DC supply, with motor insulation CL155 (F) and double insulation optional. The MAE universal motors are available with customization to the shaft design, cooling system, end brackets and further value enhancing features. UL approval is available upon request.

**STEPPER**

» **Series ST**

Offered in three main NEMA sizes, the well-known MAE hybrid stepper motors are available in different performances configurations. According to the application requirements, MAE can provide a motor with superior torque. MAE stepper motors are suitable for accurate open loop positioning applications, or high performances closed loop systems when fitted with an integrated encoder. Further customization is available including gearboxes, brakes, shaft detail, lead-wire connector assemblies and more.

**BRUSHLESS AC/DC**

» **Series BL**

The MAE electronically commutated brushless motors are offered in both internal rotor and external rotor designs, and are ideal for various industrial and ventilation market applications which require long service life in combination with high performance. MAE brushless motors deliver superior efficiency and the two available diameters can be provided with either hall sensors or sensor-less commutation. Assembled with encoders, brakes and gearboxes, this brushless motor range provides a stand-alone and flexible modular solution.






**PERMANENT MAGNET DC**

» **Series PM**

The MAE permanent magnet DC motors utilize a two-pole design, and are available in various stack heights. These motors are configured for either mains voltage AC or low voltage DC supply, with insulation CL 155 (F), and are available in highly customized mechanical configurations including the shaft design, end brackets, cooling system and further value enhancing features. Combinations with gearboxes, encoders, brakes, EMC components and liquid-pump heads are also available upon request.

**Disclaimer**

This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for product driven beyond factory specified limits, such as input voltage; temperature; speed; torque; pressure; flow, or without correct alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For products to meet specific application requirements please contact AMETEK's Sales Department.

<i>Overview</i>	
Page 10-17	<b>Products Overview &amp; Product Combination Possibilities</b>
Page 18-53	<b>Brushless Blowers</b> Series BB Series TB 
Page 54-68	<b>Stepper Motors</b> Series ST 
Page 70-79	<b>Brushless AC/DC Motors</b> Series BL 
Page 80-83	<b>Permanent Magnet DC Motor</b> Series PM 
Page 84-98	<b>Accessories</b> Gearboxes, Brakes, Encoders, Controllers, Accessories 



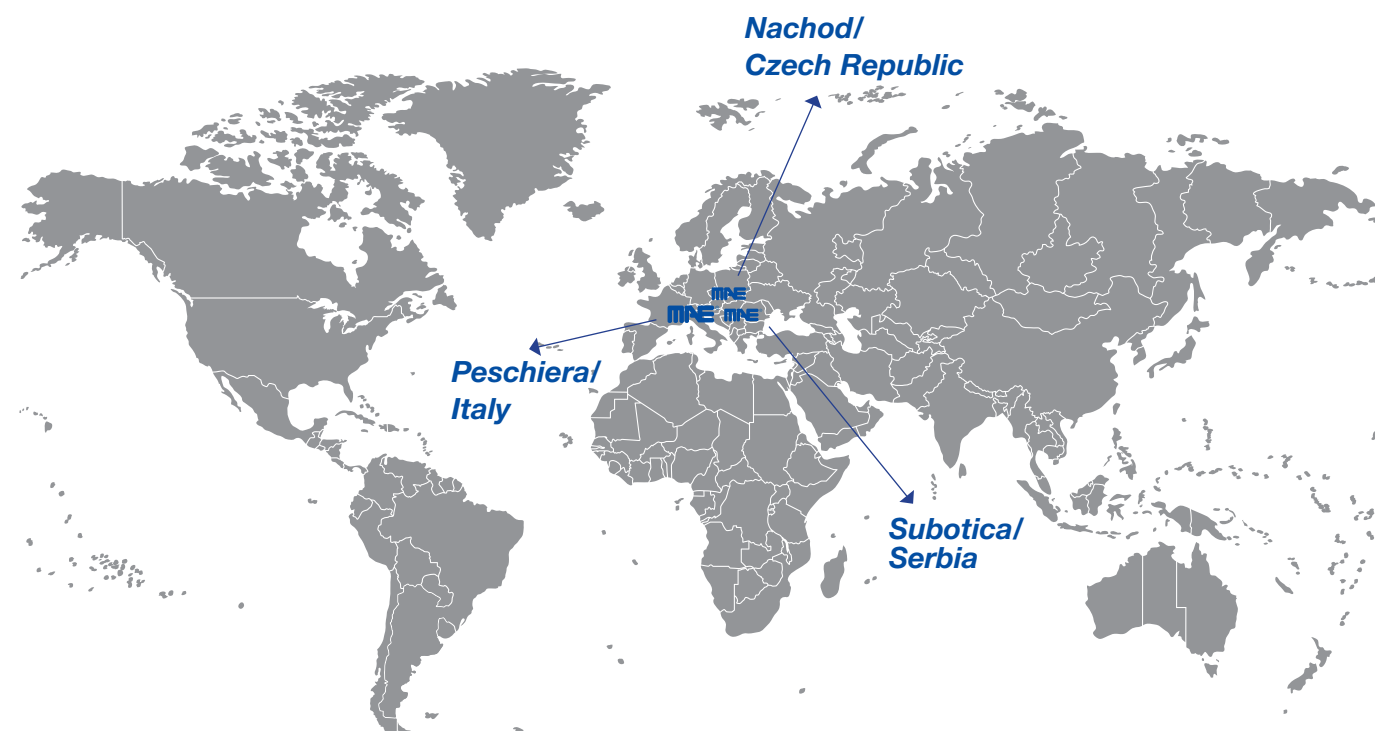


**Market Segments**

- » Industrial Automation
- » Healthcare & Laboratory
- » Power Generation & Supply
- » Agriculture
- » Building Automation
- » Mass Transit/ Motive
- » Lifestyle & Cleaning

**Customized Solutions**

The impossible takes a little longer! Customer specific solutions from MAE! Take advantage of the full range of knowledge and experience of our application specialists. We will develop the best possible motor or blower solution for You - innovative, objective and application oriented.



**MODULAR SYSTEM**

**MOTORS**

Brushless DC-Servomotors 10 - 5000 Watt	Permanent Magnet DC-Motors 3 - 370 Watt	Stepper Motors 0.1 - 14 Nm	AC-Motors 5 - 100 Watt	Universal Motors 150 - 1200 Watt	Linear Motors 19 - 3690 N	AC/DC Blowers Thru-Flow, Bypass 18 - 2130 m <sup>3</sup> /h
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**CONTROLLERS**

Integrated Controller:

External Controller: **dGo**, **dMove**, **dPro**

Communication protocols: **CANopen**, **EtherCAT**, **EtherNet/IP**, **PROFINET**, **PIV**

**GEARBOXES**

Planetary Gearboxes 0.3 - 160 Nm	Worm Gearboxes 0.75 - 30 Nm	Spirotec Gearboxes 9 - 18 Nm	Bevel Gearboxes 1.6 - 120 Nm	Spindels and Cylinders 450 - 10 000 N	Hub Gearboxes load capacity 250 - 1000 kg
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**ENCODERS**

Incremental Encoder Up to 4096 cpr	Magnetic Pulse Generators 48 cpr	Absolute Encoder Up to 4096 cpr, 16 bit multiturn
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**BRAKES**

Power-off Brakes 0.2 - 7 Nm	Power-on Brakes 0.2 - 3 Nm
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Series	<b>BU 93 AC 107 mm</b>	<b>BU 82 AC130 mm BU 82 DC130 mm</b>		<b>BU 82 DC 130 mm</b>	
Type	Bypass	Bypass		Bypass	
Fan housing diameter (mm)	107	130		130	
Fan stages	1 - 2	1		2	
Max. airflow (l/sec)	51	56	67	60	35
Max. pressure (kPa)	23.2	18.4	29.5	19.7	19.3
Rated voltage (V)	100 - 250 AC	12 / 18 / 24 / 36 DC	100 - 250 AC	230 AC	12 / 24 / 36 DC
Max. power input (W)	1320	890	1660	960	580
Max. efficiency (η%)	27.3%	41.5%	44.2%	48.1%	36.5%

Series	<b>BU 95 AC 143 mm</b>	<b>BU 93 AC 145 mm BU 93 DC 145 mm</b>	<b>BU 110 AC 182 mm</b>	
Type	Bypass	Bypass	Bypass	
Fan housing diameter (mm)	143	145	182	
Fan stages	1 - 2 - 3	1 - 2 - 3	2 - 3	
Max. airflow (l/sec)	72	35	68	57
Max. pressure (kPa)	42.1	20.2	37.7	33.1
Rated voltage (V)	100 - 250 AC	12 / 24 / 36 DC	100 - 250 AC	100 - 240 AC
Max. power input (W)	2000	740	1820	1830
Max. efficiency (η%)	41.2%	34%	37.6%	34.0%

Fan cover protection					
Inlet tube					
Thermal protection					
Water separator					
EMC components					
UL approval					
Double shaft					

Fan cover protection				
Inlet tube				
Thermal protection				
Water separator				
EMC components				
UL approval				
Double shaft				



	<b>TU 82 AC 107 mm TU 82 DC 107 mm</b>			<b>TU 82 AC 130 mm TU 82 DC 130 mm</b>		
Series						
Type	Thru Flow			Thru Flow		
Fan housing diameter (mm)	107			130		
Fan stages	1 - 2			1		
Max. airflow (l/sec)	34	55	43	49	66	54
Max. pressure (kPa)	17.3	26.9	24.3	21.0	33.9	27.3
Rated voltage (V)	12 / 24 / 36 DC	100 - 250 AC	230 AC	12 / 18 / 24 / 36 DC	100 - 250 AC	230 AC
Max. power input (W)	480	1200	860	720	2000	900
Max. efficiency (η%)	38.0%	42.0%	37%	45.4%	46.0%	50%

Fan cover protection						
Inlet tube						
Thermal protection						
EMC components						
UL approval						
Double shaft						



	<b>TU 95 AC 139 mm</b>		<b>TU 93 AC 145 mm</b>	
Series				
Type	Thru Flow		Thru Flow	
Fan housing diameter (mm)	139		145	
Fan stages	1 - 2		1 - 2 - 3	
Max. airflow (l/sec)	75	55	68	49
Max. pressure (kPa)	33.6	21.5	33.6	23.7
Rated voltage (V)	100 - 250 AC	230 AC	100 - 250 AC	230 AC
Max. power input (W)	2200	864	1660	842
Max. efficiency (η%)	46.7%	42.8%	38.0%	44.6%

Fan cover protection				
Inlet tube				
Thermal protection				
EMC components				
UL approval				
Double shaft				

Series	<b>TB 89 AC 145 mm</b>	<b>BB 89 AC 145 mm</b>	<b>BB 89 AC 182 mm</b>	<b>BB 89 AC 193 mm</b>	<b>BB 89 AC 226 mm</b>	<b>BB 158 AC 1Ph/3Ph 312 mm</b>
Family	-	-	-	-	-	-
Type	Thru Flow	ByPass	ByPass	ByPass	ByPass	ByPass
Fan housing diameter (mm)	145	145	182	193	226	312
Fan stages	1 - 2	1 - 3	2	1	1	1
Max. airflow (m³/h)	221	455	195	400	930	2130
Max. pressure (kPa)	14.2	42.0	29.0	10.8	3.5	6.5
Rated voltage (VAC)	100-240 / 230	100-240 / 230	100-240 / 230	100-240 / 230	100-240 / 230	120 / 230 1ph 240 3ph
Max. power input (W)	600	1400	1800	1400	1400	4000
Speed control signal	On-Off / 0-10 V / PWM	On-Off / 0-10 V / PWM	On-Off / 0-10 V / PWM	On-Off / 0-10 V / PWM	On-Off / 0-10 V / PWM	On-Off / 0-10 V / PWM
Output signal	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out

Universal voltage (100-240 VAC)						
Potentiometer for speed calibration						
Three phase AC input						
UL approval						





■ Preferred series ■ Standard product - MOQ may apply ■ On request

Series	<b>BB 42 DC 76 mm</b>	<b>TB 89 DC 145 mm</b>	<b>BB 89 DC 145 mm</b>
Family	-	-	-
Type	ByPass	Thru Flow	ByPass
Fan housing diameter (mm)	76	145	145
Fan stages	1	1 - 2	1 - 3
Max. airflow (m³/h)	49	230	319
Max. pressure (kPa)	9.5	16.0	19.5
Rated voltage (VDC)	12 / 24	24 / 48 / 72	24 / 48 / 72
Max. power input (W)	130	600	580
Speed control signal	On-Off / 0 - 4 V	On-Off / 0 - 10 V	On-Off / 0 - 10 V
Output signal	Tach Out	Tach Out	Tach Out
Version	<b>dGo dCore</b>	-	-

External controller			
Potentiometer for speed calibration			
UL approval			




■ Preferred series ■ Standard product - MOQ may apply ■ On request



				
Series	<b>DU 56</b>	<b>DU 58</b>	<b>DU 76</b>	<b>DU 93</b>
Stack length (mm)	x10 / x12 / x15 / x21 / x25 / x35 / x40 / x45	x25 / x30 / x36 / x40	x21 / x25 / x30 / x40 / x45	x25 / x30 / x35 / x38 / x43 / x50 / x60
Max. output power (W)	150	300	1000	1200
Rated voltage (VAC/DC)	12-48 DC 100-240 AC	12-48 DC 100-240 AC	12-48 DC 100-240 AC	12-48 DC 100-240 AC
Speed range (Rpm)	5000 - 25000	5000 - 25000	5000 - 25000	5000 - 25000
Max. rated torque (Ncm)	10	15	38	42

Thermal protection				
Double insulation				
Gearbox				
Ventilation (internal or external)				
Multiple speeds				
Double shaft				
UL approval				

■ Preferred series ■ Standard product - MOQ may apply ■ On request

			
Series	<b>ST 17</b>	<b>ST 23</b>	<b>ST 34</b>
Motor length (Nema)	x14 / x16 / x20 / x24	x16 / x21 / x31	x37 / x48 / x55 / x62
Rated current (A)	0.4 - 2.00	1.00 - 4.00	3.00 - 8.00
Holding torque (Ncm)	27 - 79	70 - 210	520 - 1200
Rotor inertia (gcm <sup>2</sup> )	40 - 114	77 - 335	2860 - 7030
Max. voltage (VDC)	50	80	160
Number of wires	4	4	4
Connection	Connector	Connector	Leads


Double shaft	5x15	5x15	5x20
Encoder	RE 30	RE 30	RE 30
Planetary gearbox	PLG 42 SP	PLG 52 SP	PLG 75 SP
Integrated/ attached controllers	CO/MB	<b>sGo</b>	CO/MB/EC
		<b>sGo</b>	
			CO/MB/EC

■ Preferred series ■ Standard product - MOQ may apply ■ On request

				
Series	<b>BL 42 dGo</b>	<b>BL 57 dCore</b>		<b>BL 89 SI AC</b>
Number of poles	6	4	8	4
Motor length (mm)	x50	x56 / x76 / x96	x56 / x76 / x96	x111
Rated output power (W)	119	46 - 153	33 - 111	230
Rated voltage (V)	230 AC	24 / 40 DC	24 / 40 DC	110 / 230 AC
Rated speed (Rpm)	28000	3850 - 4180	2850 - 3350	up to 12000
Rated torque (Ncm)	4	11 - 35	11-33	65

Encoder		RE 20 RE 30	RE 20 RE 30	
Brake		E 90R	E 90R	
Planetary gearbox		PLG 42S PLG 52	PLG 42S PLG 52	
Right angular gearbox		SG 65 SG 80	SG 65 SG 80	

■ Preferred series ■ Standard product - MOQ may apply ■ On request

	
Series	<b>PM 62</b>
Stack length (mm)	x25 / x30 / x40
Rated output power (W)	57-123
Rated voltage (VDC)	12 / 24 / 48 / 100-240
Speed range (Rpm)	3000 - 9000
Rated torque (Ncm)	6-20

EMC components	
Thermal protection	
Ventilation (internal or external)	
Double shaft	
UL approval	

■ Preferred series ■ Standard product - MOQ may apply ■ On request



# Brushless Blowers

» **Series TB**

» **Series BB**



## Brushless Blowers AC

Page 20	TB 89 AC 145 mm   Blower Thru Flow Brushless
Page 22	BB 89 AC 145 mm 1-Stage Standard-Flow   Blower ByPass Brushless
Page 24	BB 89 AC 145 mm 1-Stage High-Flow   Blower ByPass Brushless
Page 26	BB 89 AC 145 mm 2-Stage   Blower ByPass Brushless
Page 28	BB 89 AC 145 mm 3-Stage   Blower ByPass Brushless
Page 30	BB 89 AC 182 mm 2-Stage High-Flow   Blower ByPass Brushless
Page 32	BB 89 AC 193 mm   Blower ByPass Brushless
Page 34	BB 89 AC 226 mm   Blower ByPass Brushless
Page 36	BB 158 AC 1Ph 312 mm   Blower ByPass Brushless
Page 38	BB 158 AC 3Ph 312 mm   Blower ByPass Brushless

## Brushless Blowers DC

Page 40	BB 42 <b>dCore</b> DC 76 mm   Blower ByPass Brushless
Page 42	BB 42 <b>dGo</b> DC 76 mm   Blower ByPass Brushless
Page 44	TB 89 DC 145 mm   Blower Thru Flow Brushless
Page 46	BB 89 DC 145 mm 1-Stage   Blower ByPass Brushless
Page 48	BB 89 DC 145 mm 2-Stage   Blower ByPass Brushless
Page 50	BB 89 DC 145 mm 3-Stage   Blower ByPass Brushless
Page 52	BB 89 AC 145 mm   Mechanical Options



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing

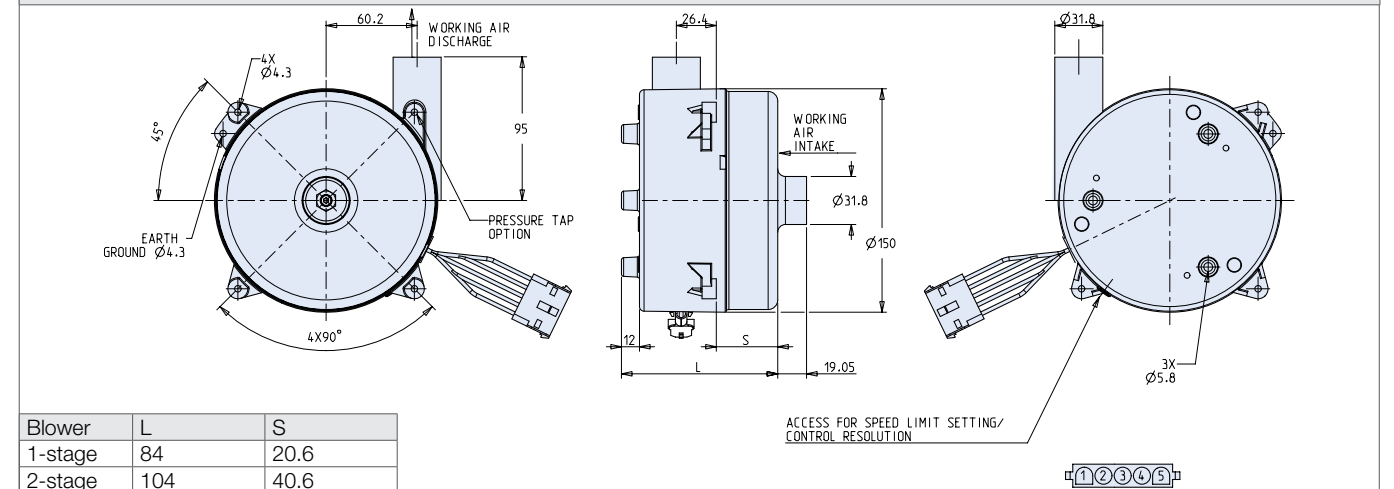


Data		1-Stage	2-Stage
Nominal voltage	V	100-240	100-240
Frequency	Hz	50/60	50/60
Phase	~	1	1
Fan housing diameter	mm	145	145
Fan stages	n°	1	2
Max. airflow	m³/h	221	122
Max. pressure	kPa	9	14.2
Max. vacuum	kPa	8.4	13.4
Input power	W	600	600
Current @ 120V	A	10	10
Current @ 230V	A	5	5
Max. speed	rpm	19000	17000
Weight	Kg	2.7	2.7
<b>Standard Features</b>			
Speed command input	VDC	0-10	0-10

Options

- A) Mechanical
  - » No inlet tube on working air
  - » Various mounting patterns
- B) Electrical / Software
  - » Digital output signal
  - » Tach resolution (1 to 6 ppr)
  - » Speed command input (PWM or 5 - 20mA)
  - » Customized software functions

Dimensions in mm



Speed Control Options and Electrical Connection

PWM: 400Hz – 20Mz +10V nominal, min 10% duty cycle

Pin #	Function
1	Speed command PWM
2	Speed command PWM

Current: 5mA – 20mA +10V nominal

Pin #	Function
1	Speed command current
2	Speed command current

On/Off: Without Electrical Speed Control

Pin #	Function
1	Not used
2	Not used

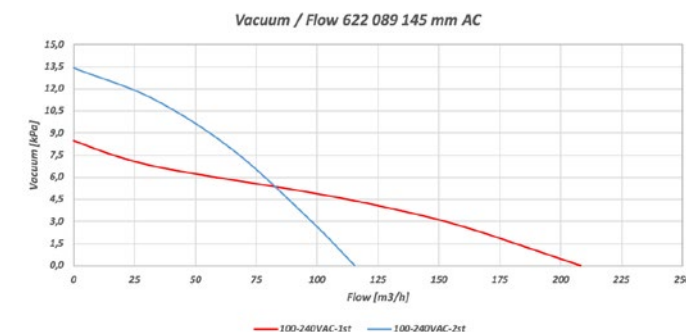
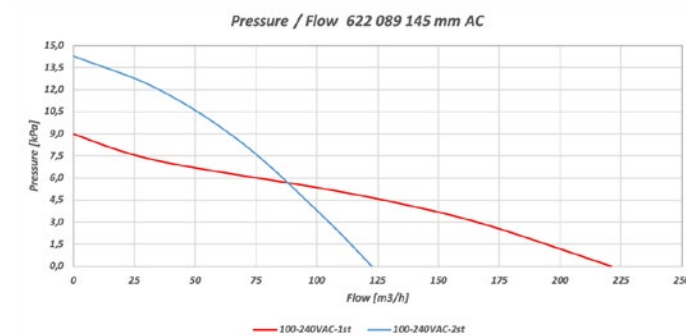
Pin Assignment

Connector: 05P AMP Mate-N-Lok 350810-1

Connector Pins: Male AMP 350873-1

Pin #	Function
1	Speed command 0-10VDC
2	Speed command 0-10VDC
3	Ground
4	Line
5	Neutral

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing



Data		650W	1200W	1400W
Nominal voltage	VAC	100-240	100-240	230
Frequency	Hz	50/60	50/60	50/60
Phase	~	1	1	1
Fan housing diameter	mm	145	145	145
Fan stages	n°	1	1	1
Max. airflow	m³/h	170	272	300
Max. pressure	KPa	7.6	14	15.5
Max. vacuum	KPa	7.2	13.4	15
Input power	W	650	1200	1400
Current @ 120V	A	7	12	-
Current @ 230V	A	5	9	11
Max. speed	rpm	13500	22500	25000
Weight	Kg	2.7	2.7	2.7
<b>Standard Features</b>				
Speed command input	VDC	0-10	0-10	0-10

Options

A) Mechanical

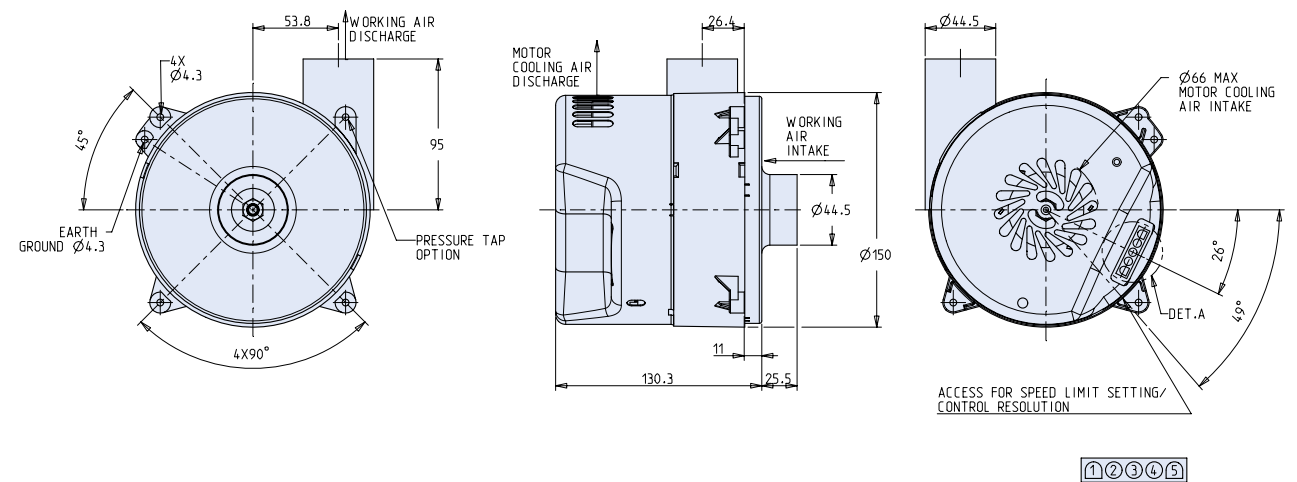
- » Enhanced corrosion protection
- » No inlet tube on working air
- » Working air peripheral discharge
- » Cooling air inlet tube
- » Various mounting patterns

B) Electrical / Software

- » Various digital output signals
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5 - 20mA)
- » Open-loop speed control

- » Customized software functions
- » External potentiometer input
- » Auxiliary DC voltage output

Dimensions in mm



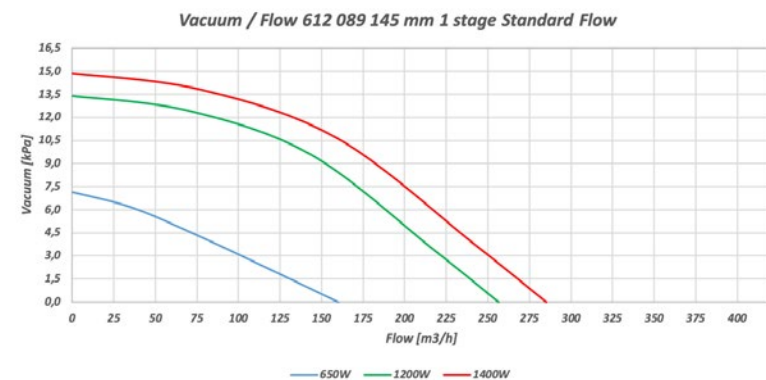
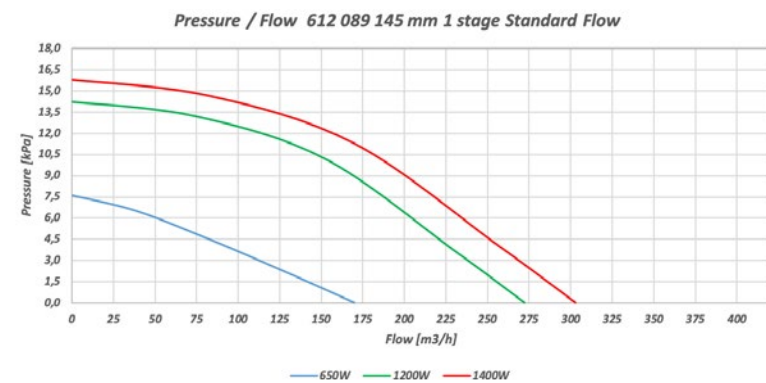
See page 50 for Mechanical Options  
See page 97 for Connector Harnesses

Pin Assignment

Mating Connector: AMP Mate-N-Lok 350809-1 using universal Mate-N-Lok Sockets with 18 gauge wire  
Mating Connector Pins: Mate-N-Lok 350874-1

Pin #	Function
1	Speed command 0-10VDC
2	Speed command 0-10VDC
3	Ground
4	Line
5	Neutral

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control

- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing



Data		650W	1200W	1400W
Nominal voltage	VAC	100-240	100-240	230
Frequency	Hz	50/60	50/60	50/60
Phase	~	1	1	1
Fan housing diameter	mm	145	145	145
Fan stages	n°	1	1	1
Max. airflow	m3/h	350	410	455
Max. pressure	KPa	5.6	10	11.1
Max. vacuum	KPa	5.3	9.4	10.5
Input power	W	650	1200	1400
Current @ 120V	A	7	12	-
Current @ 230V	A	5	9	11
Max. speed	rpm	13500	22500	25000
Weight	Kg	2.7	2.7	2.7
<b>Standard Features</b>				
Speed command input	VDC	0-10	0-10	0-10

Options

A) Mechanical

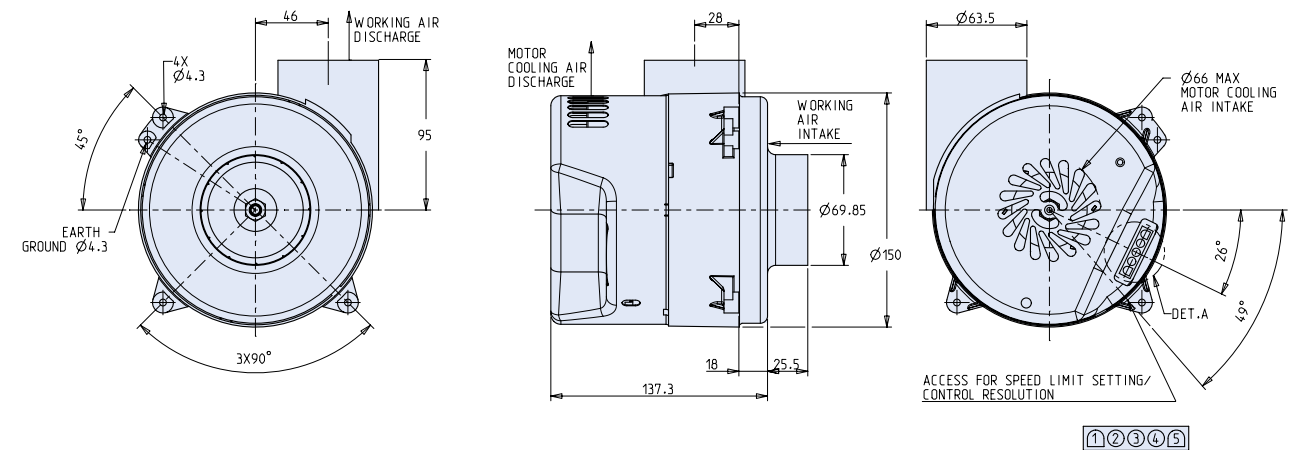
- » Enhanced corrosion protection
- » No inlet tube on working air
- » Working air peripheral discharge
- » Cooling air inlet tube
- » Various mounting patterns

B) Electrical / Software

- » Various digital output signals
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5 - 20mA)
- » Open-loop speed control

- » Customized software functions
- » External potentiometer input
- » Auxiliary DC voltage output

Dimensions in mm



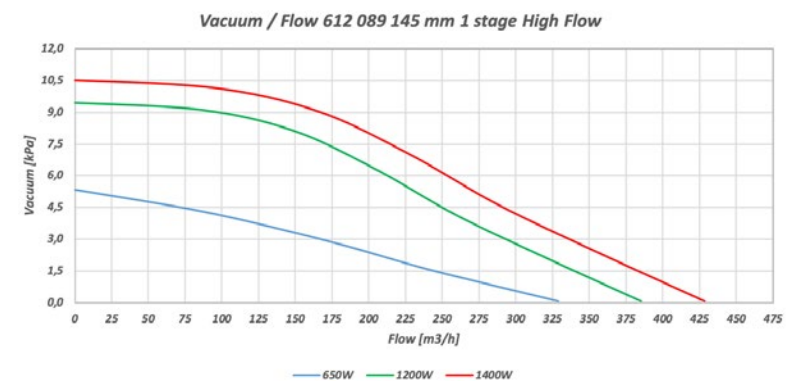
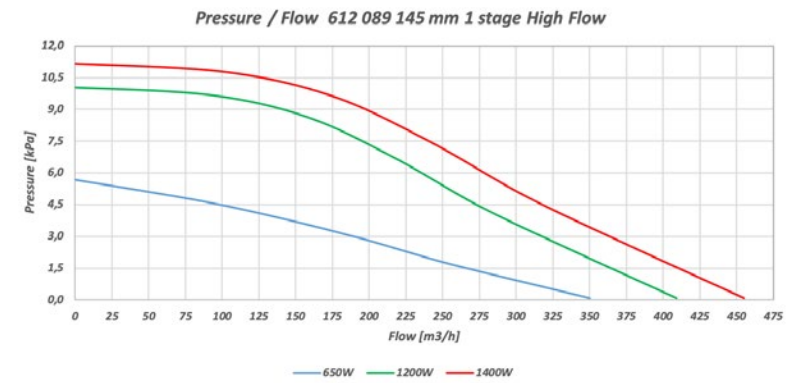
See page 50 for Mechanical Options  
See page 97 for Connector Harnesses

Pin Assignment

Mating Connector: AMP Mate-N-Lok 350809-1, using universal Mate-N-Lok Sockets with 18 gauge wire  
Mating Connector Pins: Mate-N-Lok 350874-1

Pin #	Function
1	Speed command 0-10VDC
2	Speed command 0-10VDC
3	Ground
4	Line
5	Neutral

Characteristic diagram





- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing



Data		650W	1200W	1400W
Nominal voltage	VAC	100-240	100-240	230
Frequency	Hz	50/60	50/60	50/60
Phase	~	1	1	1
Fan housing diameter	mm	145	145	145
Fan stages	n°	2	2	2
Max. airflow	m3/h	178	223	234
Max. pressure	KPa	12.5	21.5	27.5
Max. vacuum	KPa	11.7	20.3	26
Input power	W	650	1200	1400
Current @ 120V	A	7	12	-
Current @ 230V	A	5	9	11
Max. speed	rpm	15000	23000	24500
Weight	Kg	2.7	2.7	2.7
<b>Standard Features</b>				
Speed command input	VDC	0-10	0-10	0-10

Options

A) Mechanical

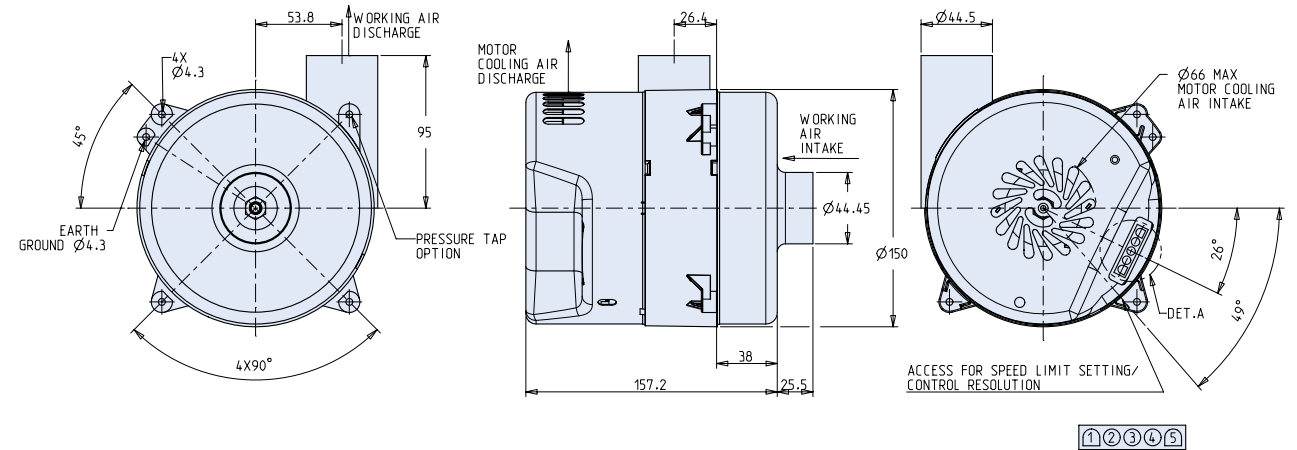
- » Enhanced corrosion protection
- » No inlet tube on working air
- » Working air peripheral discharge
- » Cooling air inlet tube
- » Various mounting patterns

B) Electrical / Software

- » Various digital output signals
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5 - 20mA)
- » Open-loop speed control

- » Customized software functions
- » External potentiometer input
- » Auxiliary DC voltage output

Dimensions in mm



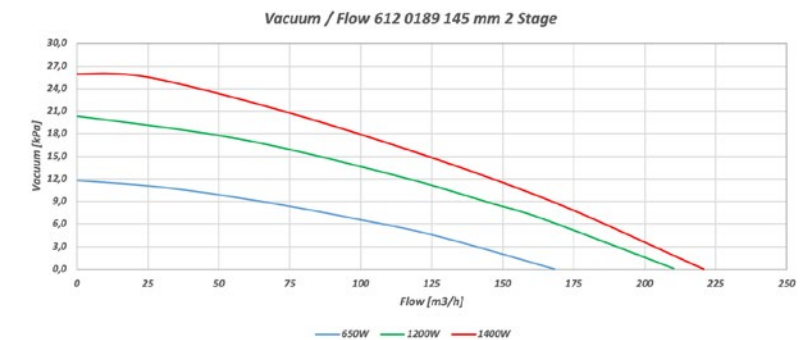
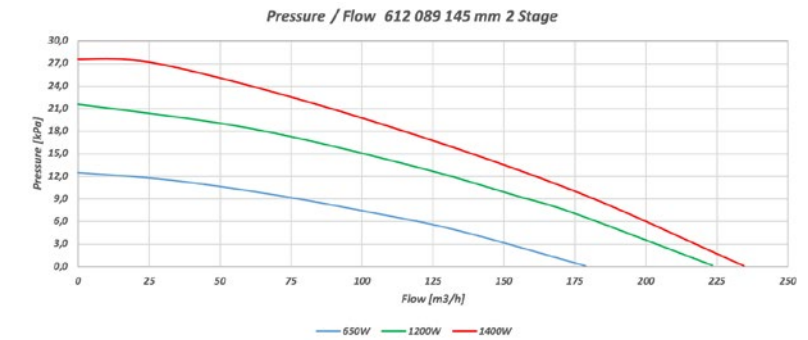
See page 50 for Mechanical Options  
See page 97 for Connector Harnesses

Pin Assignment

Mating Connector: AMP Mate-N-Lok 350809-1, using universal Mate-N-Lok Sockets with 18 gauge wire  
Mating Connector Pins: Mate-N-Lok 350874-1

Pin #	Function
1	Speed command 0-10VDC
2	Speed command 0-10VDC
3	Ground
4	Line
5	Neutral

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing



Data		650W	1200W	1400W
Nominal voltage	VAC	100-240	100-240	230
Frequency	Hz	50/60	50/60	50/60
Phase	~	1	1	1
Fan housing diameter	mm	145	145	145
Fan stages	n°	3	3	3
Max. airflow	m3/h	73	145	150
Max. pressure	KPa	19	38.5	42
Max. vacuum	KPa	18.1	36.3	39.6
Input power	W	650	1200	1400
Current @ 120V	A	7	12	-
Current @ 230V	A	5	9	11
Max. speed	rpm	13500	23000	25000
Weight	Kg	2.7	2.7	2.7
<b>Standard Features</b>				
Speed command input	VDC	0-10	0-10	0-10

Options

A) Mechanical

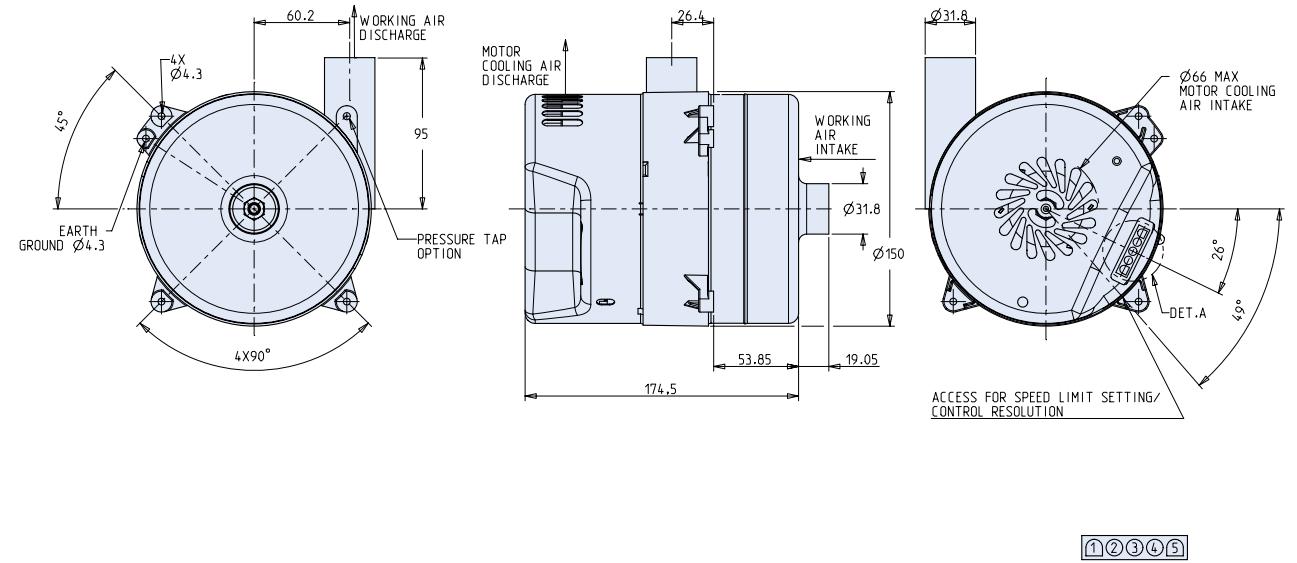
- » Enhanced corrosion protection
- » No inlet tube on working air
- » Working air peripheral discharge
- » Cooling air inlet tube
- » Various mounting patterns

B) Electrical / Software

- » Various digital output signals
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5 - 20mA)
- » Open-loop speed control

- » Customized software functions
- » External potentiometer input
- » Auxiliary DC voltage output

Dimensions in mm



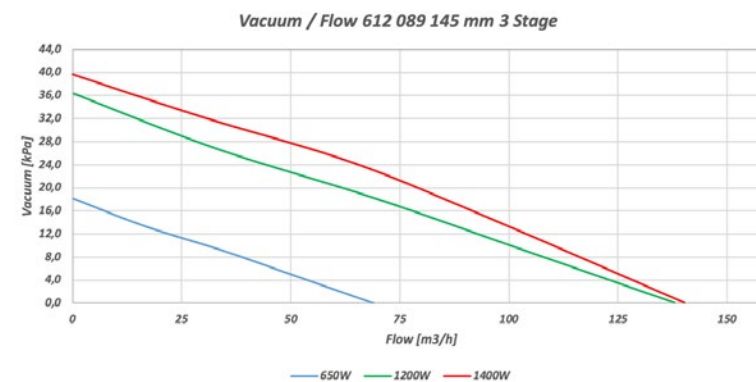
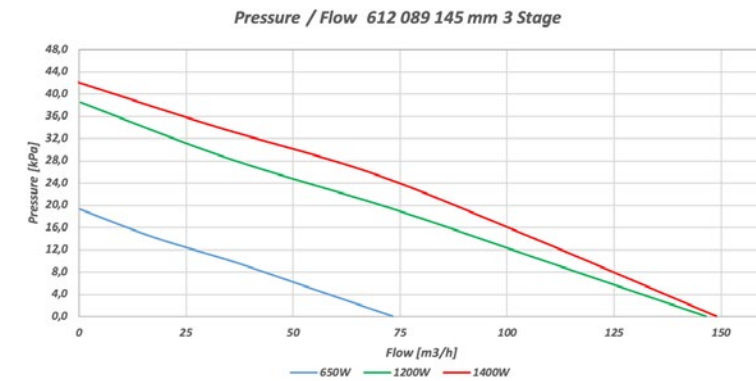
See page 50 for Mechanical Options  
See page 97 for Connector Harnesses

Pin Assignment

Mating Connector: AMP Mate-N-Lok 350809-1, using universal Mate-N-Lok Sockets with 18 gauge wire  
Mating Connector Pins: Mate-N-Lok 350874-1

Pin #	Function
1	Speed command 0-10VDC
2	Speed command 0-10VDC
3	Ground
4	Line
5	Neutral

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing

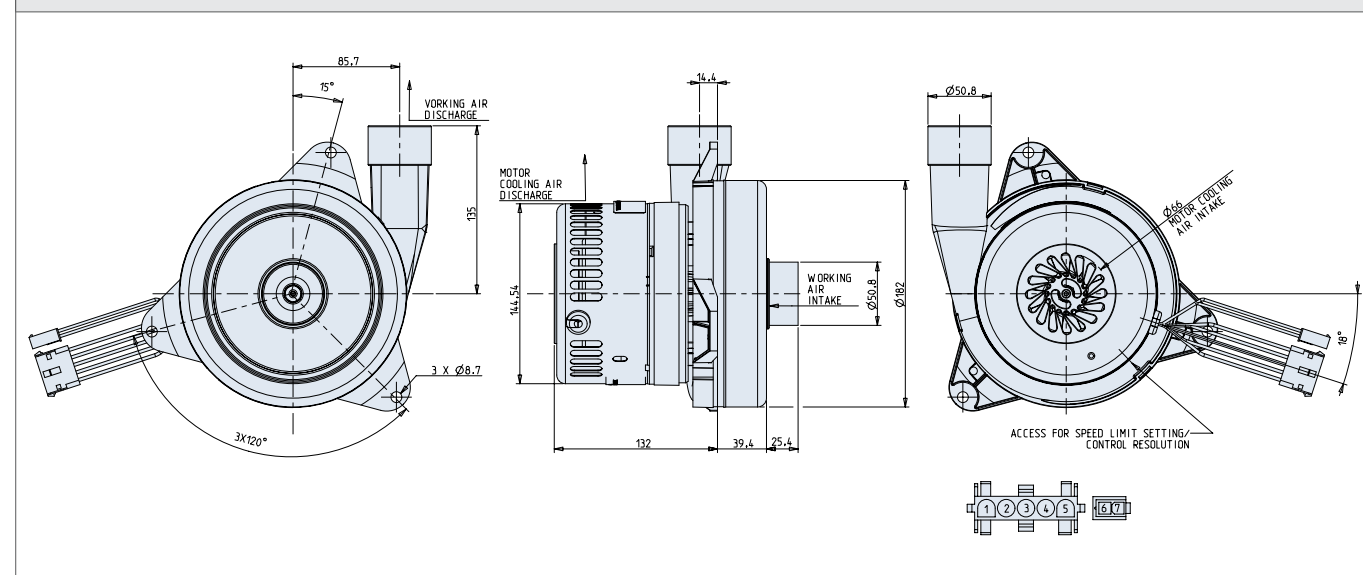


Data		1800W
Nominal voltage	VAC	230
Frequency	Hz	50/60
Phase	~	1
Fan housing diameter	mm	182
Fan stages	n°	2
Max. airflow	m3/h	195
Max. pressure	KPa	29
Max. vacuum	KPa	27
Input power	W	1800
Current @ 230V	A	13
Max. speed	rpm	25000
Weight	Kg	3.0
<b>Standard Features</b>		
Speed command input	VDC	0-10

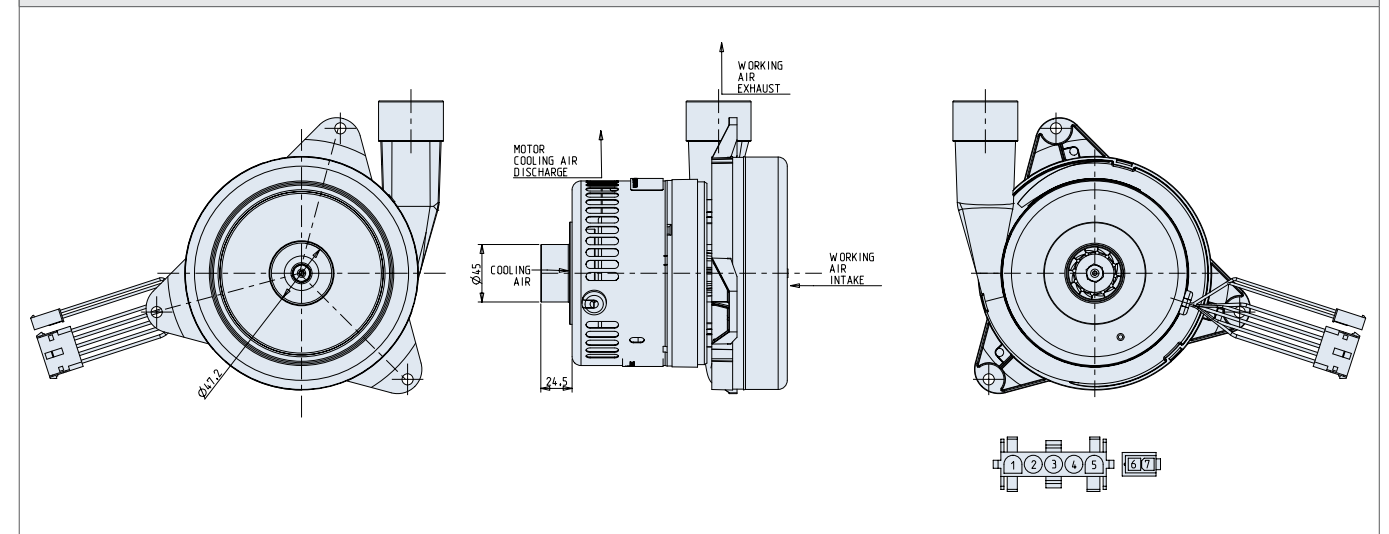
Options

- A) Mechanical
  - » Enhanced corrosion protection
  - » No inlet tube on working air
  - » Cooling air inlet tube
- B) Electrical / Software
  - » Status output
  - » Tach output resolution (up to 6 ppr)
  - » Speed command input (PWM or 5 - 20mA)
  - » Open-loop speed control
  - » Universal Voltage Input with lower max power
  - » Customized software functions
  - » External potentiometer input
  - » Auxiliary DC voltage output

Dimensions in mm/ standard model



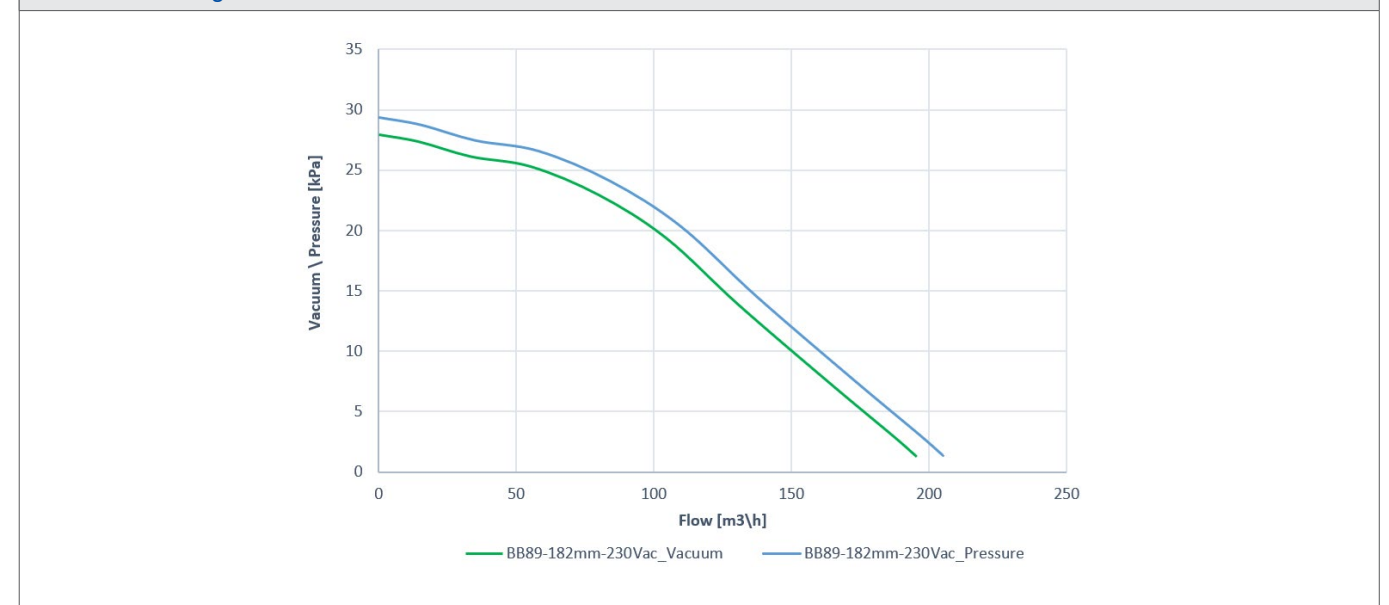
Dimensions in mm/ model with optional inlet tube on colling air intake; no inlet tube on working air intake; tach/status output



**Pin Assignment**  
 Mating Connector: AMP Mate-N-Lok 350809-1, using universal Mate-N-Lok Sockets with 18 gauge wire  
 Mating Connector Pins: Mate-N-Lok 350874-1

Pin #	Function
1	Speed command 0-10VDC
2	Speed command 0-10VDC
3	Ground
4	Line
5	Neutral
6	Tach/status output - optional
7	Tach/status output - optional

Characteristic diagram





- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing



Data		650W	1200W	1400W
Nominal voltage	VAC	100-240	100-240	230
Frequency	Hz	50/60	50/60	50/60
Phase	~	1	1	1
Fan housing diameter	mm	193	193	193
Fan stages	n°	1	1	1
Max. airflow	m3/h	310	370	400
Max. pressure	KPa	9.7	10.8	10.8
Max. vacuum	KPa	9	9.8	9.8
Nominal Max. Input power	W	650	1200	1400
Current @ 120V	A	8	12.2	-
Current @ 230V	A	5	8.6	10
Max. speed	rpm	15000	15000	15000
Weight	Kg	2.7	2.7	2.7
<b>Standard Features</b>				
Speed command input	VDC	0-10	0-10	0-10
Tach output	ppr	2	2	2

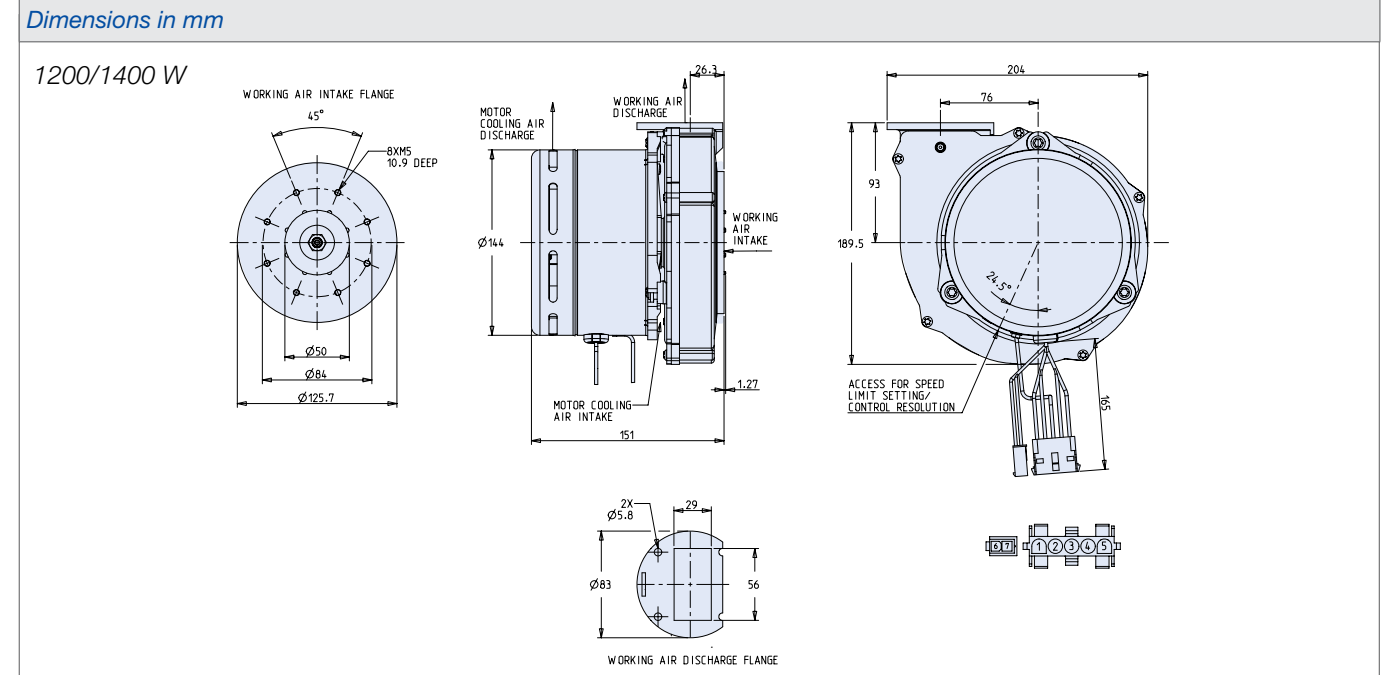
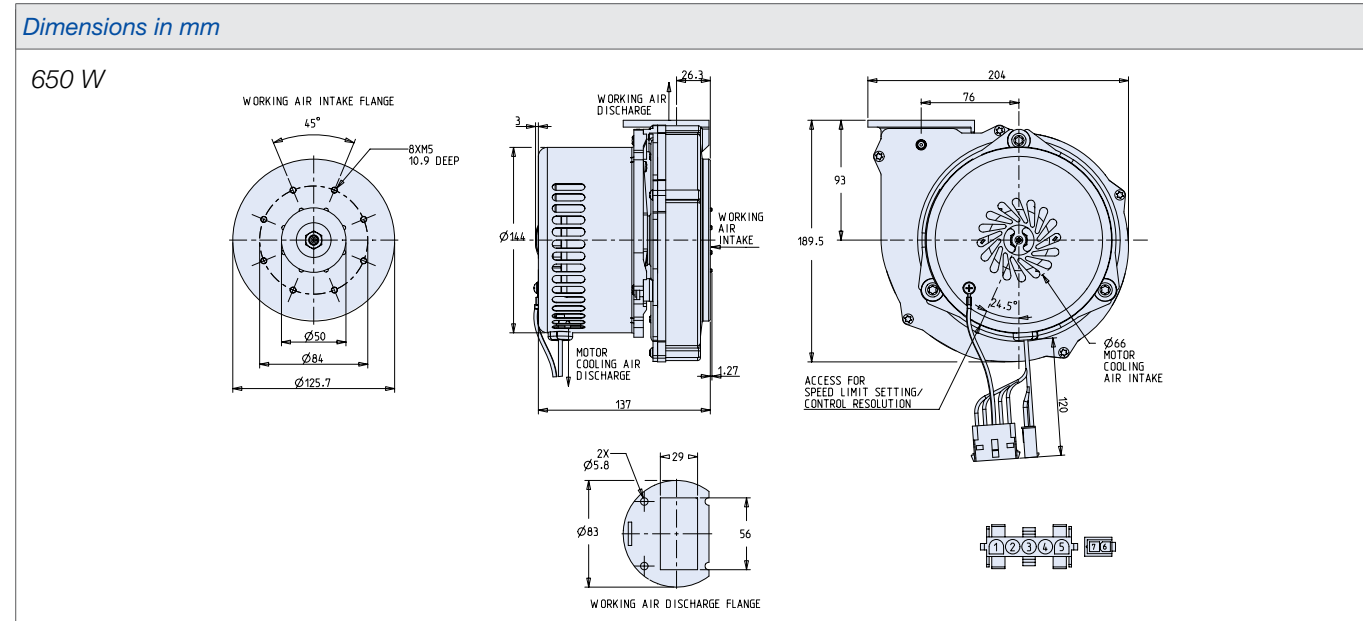
Options

A) Mechanical

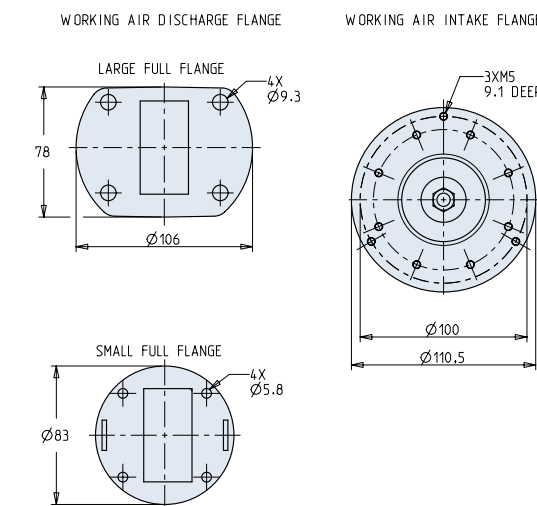
- » Enhanced corrosion protection
- » various exhaust flange details
- » various inlet flange details

B) Electrical / Software

- » Various digital output signals (tach-out 2ppr std.)
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5-20mA)
- » Open-loop speed control
- » Customized software functions
- » External potentiometer input s
- » Auxiliary DC voltage output
- » without digital output (cable/connector removed)



Mechanical options



Speed Control options and Electrical Connection

**Pin Assignment**

Pin #	Function	Pin #	Function
1	Speed command Common	6	Signal Digital Output
2	Speed command 0-10VDC	7	Common Digital Output
3	Ground		
4	Line		
5	Neutral		

PWM: 400Hz – 20Mz +10V nominal, min 10% duty cycle

Pin #	Function
1	Speed command PWM
2	Speed command PWM

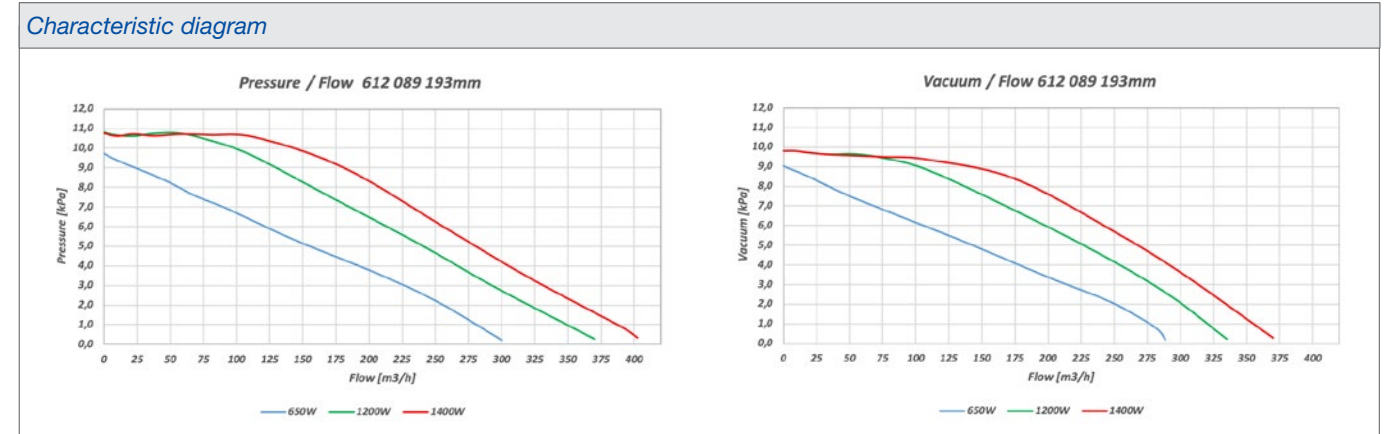
Current: mA – 20mA +10V nominal

Pin #	Function
1	Speed command current
2	Speed command current

On/Off: Without Electrical Speed Control

Pin #	Function
1	Not used
2	Not used

Molex connector (Pin # 6 & 7) not present



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals
- » Closed-Loop speed control
- » Universal voltage capability
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller
- » Aerodynamically optimized impeller and housing



Data		850W	1200W	1400W
Nominal voltage	VAC	100-240	100-240	230
Frequency	Hz	50/60	50/60	50/60
Phase	~	1	1	1
Fan housing diameter	mm	226	226	226
Fan stages	n°	1	1	1
Max. airflow	m³/h	730	895	930
Max. pressure	kPa	3.5	3.5	3.5
Max. vacuum	kPa	3.3	3.3	3.3
Input power	W	850	1200	1400
Current @ 120V	A	9	12	-
Current @ 230V	A	7	9	10
Max. speed	rpm	11000	11000	11000
Weight	Kg	4	4	4
<b>Standard Features</b>				
Speed command input	VDC	0-10	0-10	0-10
Tach output	ppr	2	2	2

Options

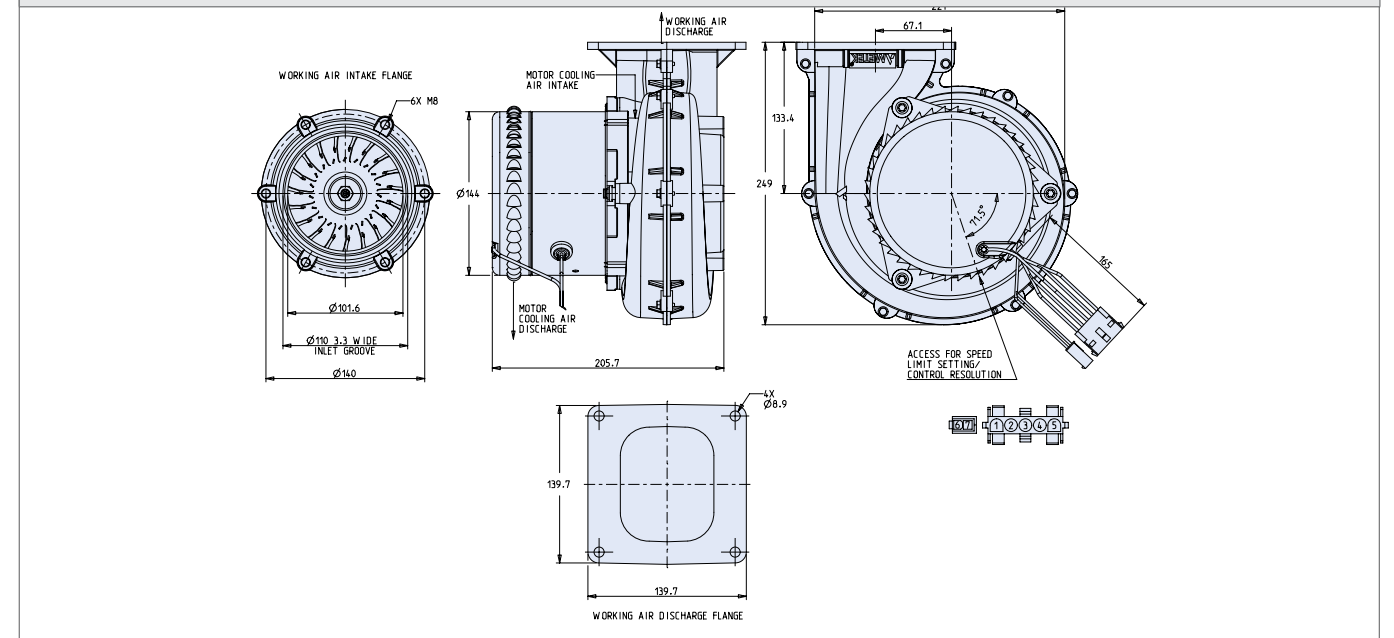
A) Mechanical

- » Enhanced corrosion protection

B) Electrical / Software

- » Various digital output signals (tach-out 2ppr std.)
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5-20mA)
- » Open-loop speed control
- » Customized software functions
- » External potentiometer input s
- » Auxiliary DC voltage output
- » Without digital output

Dimensions in mm



Speed Control options and Electrical Connection

**PWM: 400Hz – 20Mz +10V nominal, min 10% duty cycle**

Pin #	Function
1	Speed command PWM
2	Speed command PWM

**Current: 5mA – 20mA +10V nominal**

Pin #	Function
1	Speed command current
2	Speed command current

**On/Off: Without Electrical Speed Control**

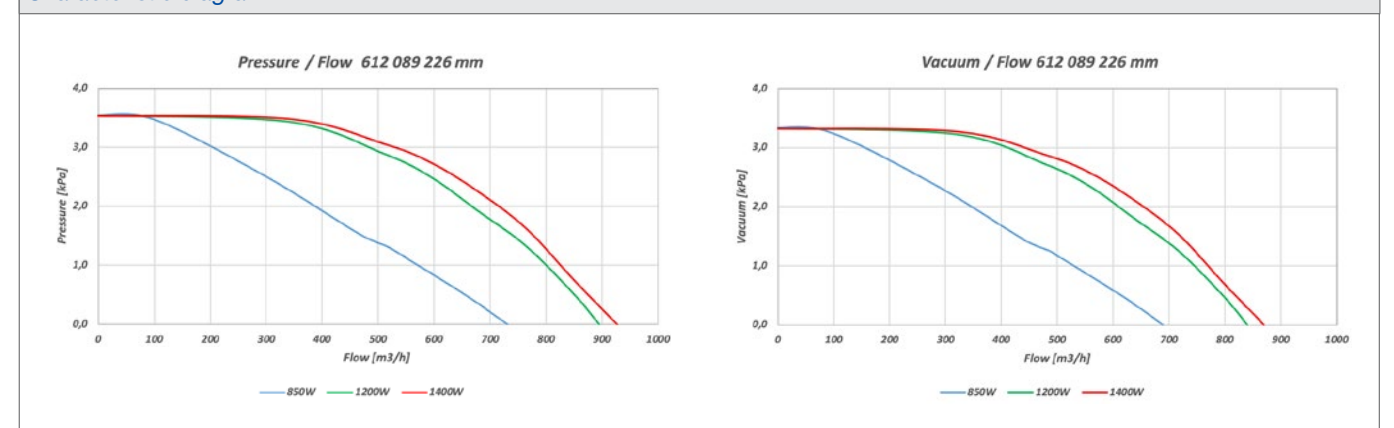
Pin #	Function
1	Not used
2	Not used

Molex connector (Pin # 6 & 7) not present

Pin Assignment

Pin #	Function	Pin #	Function
05P AMP Mate-N-Lok 350810-1		2 Pole Molex 39-01-3029	
Male Pins AMP 350873-1		Male Pins Molex PN 39000061	
1	Speed command Common	6	Signal Digital Output
2	Speed command 0-10VDC	7	Common Digital Output
3	Ground		
4	Line		
5	Neutral		

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals

- » Aerodynamically optimized impeller and housing
- » Closed-Loop speed control
- » Robust aluminium housing and impeller



Data		2500W	1800W
Nominal voltage	VAC	120	230
Frequency	Hz	60	50
Phase	~	1	1
Fan housing diameter	mm	312	312
Fan stages	n°	1	1
Max. airflow	m³/h	1850	1620
Max. pressure	KPa	4.8	4.8
Max. vacuum	KPa	4.4	4.4
Input power	W	2500	1800
Current	A	28	13
Max. speed	rpm	9500	9500
Weight	Kg	12.7	12.7
<b>Standard Features</b>			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

A) Mechanical

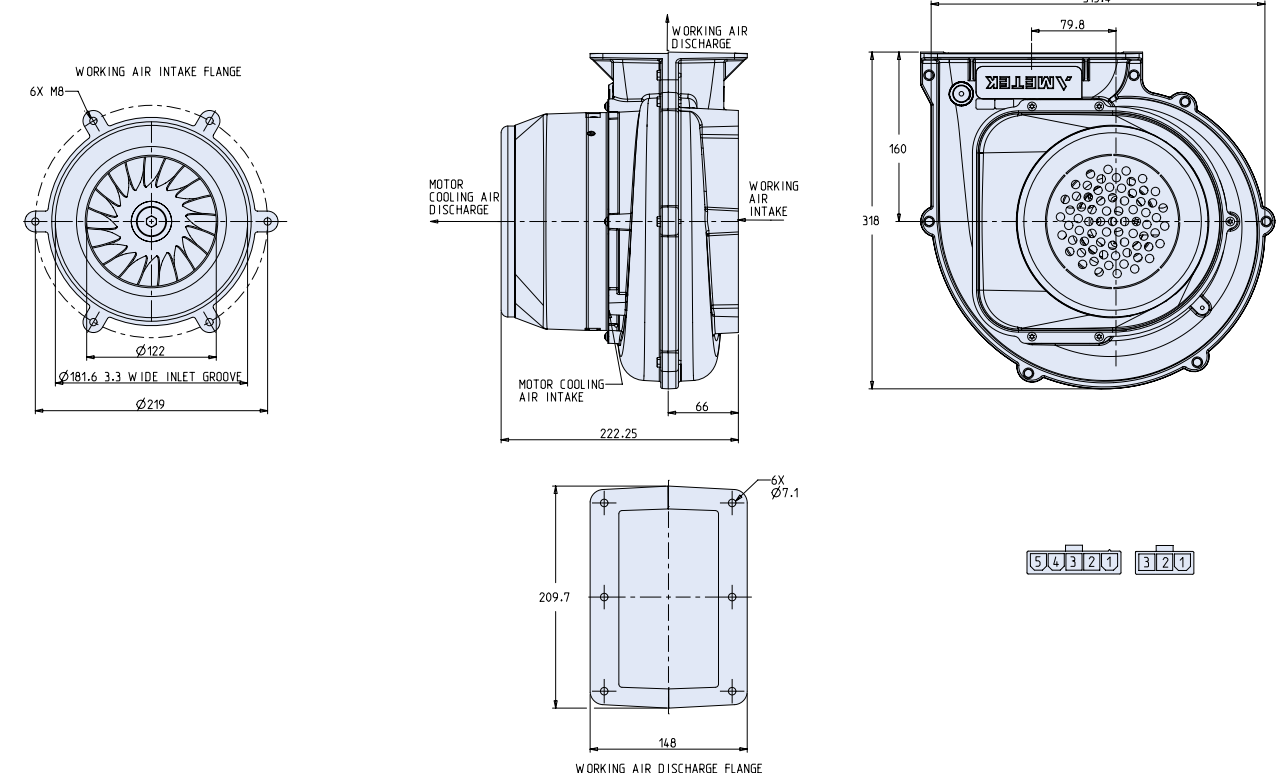
- » Large exhaust flange

B) Electrical / Software

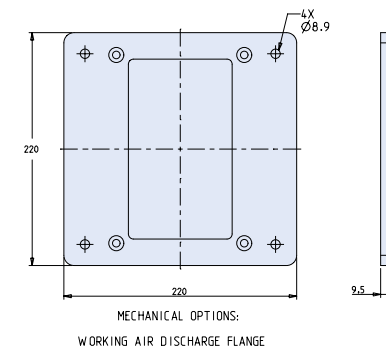
- » Various digital output signals (tach-out 2ppr std.)
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5-20mA)
- » Open-loop speed control

- » Customized software functions
- » External potentiometer input s
- » Auxiliary DC voltage output
- » Without digital output

Dimensions in mm



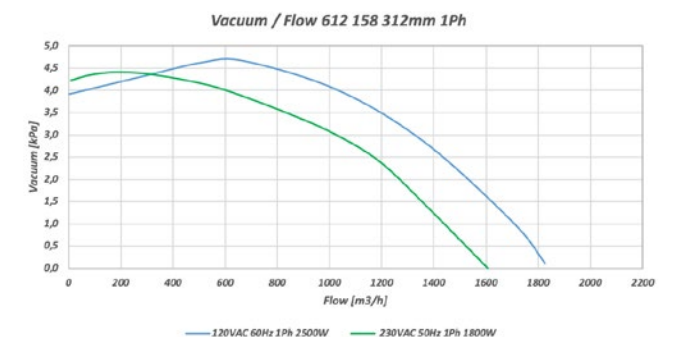
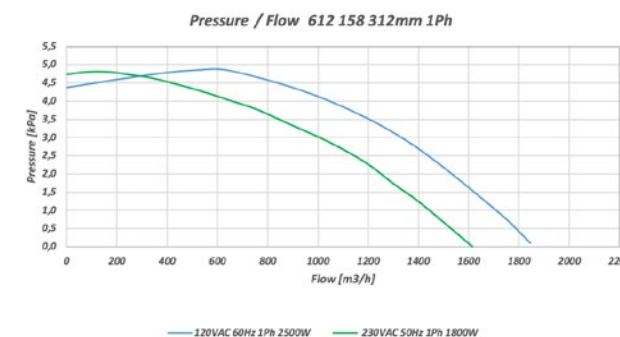
Mechanical options



See page 97 for Connector Harnesses

Pin Assignment			
120V	Molex 10-89-7042	Molex 39-30-3056	
230V	Molex 1-350943-0	Molex 39-30-3056	
Pin #	Function (Power)	Pin #	Function (Control)
1	AC Input (Common)	1	Not used
2	A/C Input	2	Tach Output
3	Not used	3	Signal input 0..10V
		4	Not used
		5	Control Ground

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard controller with digital signal processor (DSP)
- » Programmable for various speed profiles and signals

- » Aerodynamically optimized impeller and housing
- » Closed-Loop speed control
- » Robust aluminium housing and impeller



Data		60 Hz	50 Hz
Nominal voltage	VAC	240	400
Voltage Range	VAC	-	380 - 575
Frequency	Hz	60	50
Phase	~	3	3
Fan housing diameter	mm	312	312
Fan stages	n°	1	1
Max. airflow	m3/h	2139	2105
Max. pressure	KPa	6.1	6
Max. vacuum	KPa	5.8	5.7
Input power	W	3700	3800
Current	A	15	9
Max. speed	rpm	9300	9300
Weight	Kg	12.7	12.7
<b>Standard Features</b>			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

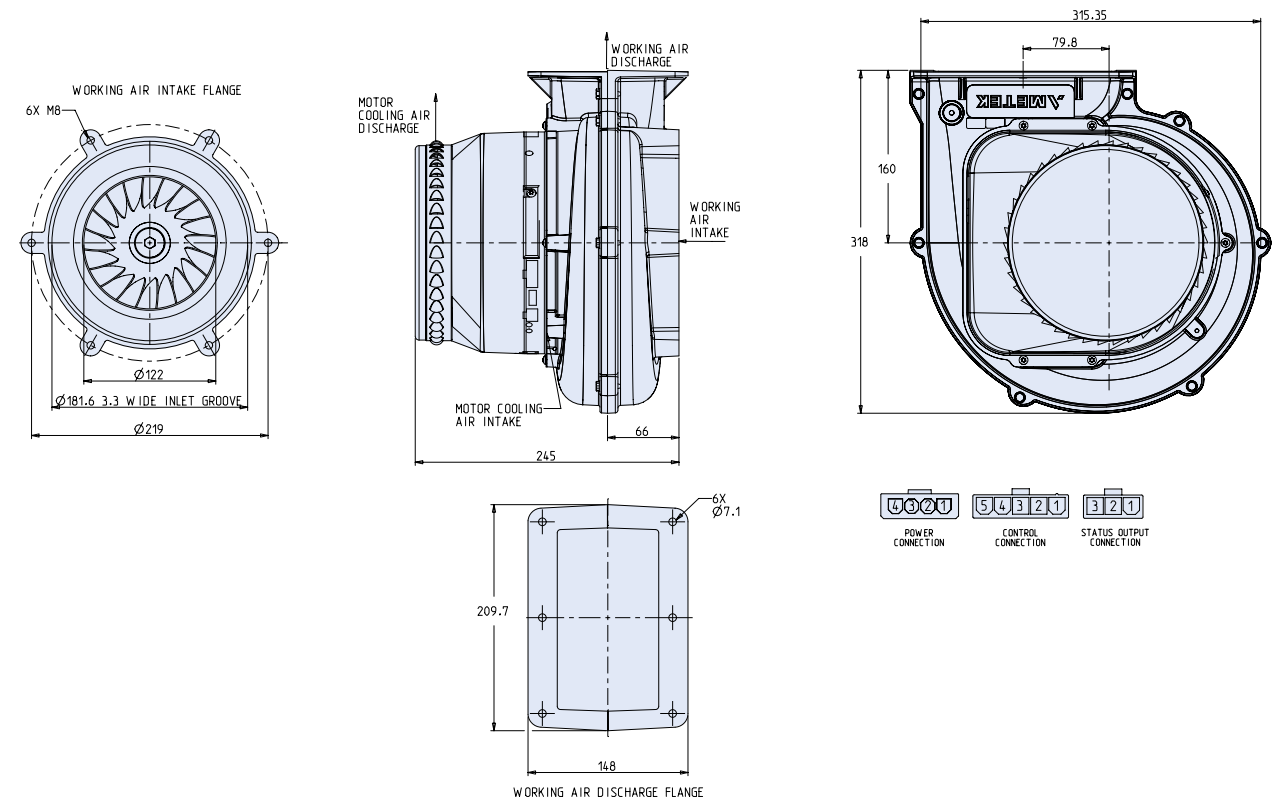
- A) Mechanical
- » Large exhaust flange

B) Electrical / Software

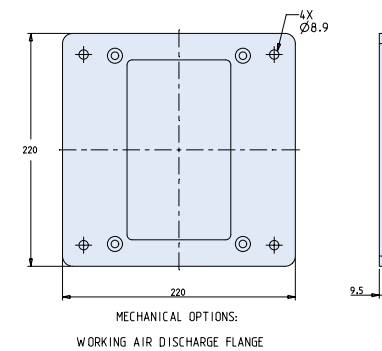
- » Various digital output signals (tach-out 2ppr std.)
- » Tach output resolution (up to 6 ppr)
- » Speed command input (PWM or 5-20mA)
- » Open-loop speed control

- » Customized software functions
- » External potentiometer input s
- » Auxiliary DC voltage output
- » Without digital output

Dimensions in mm



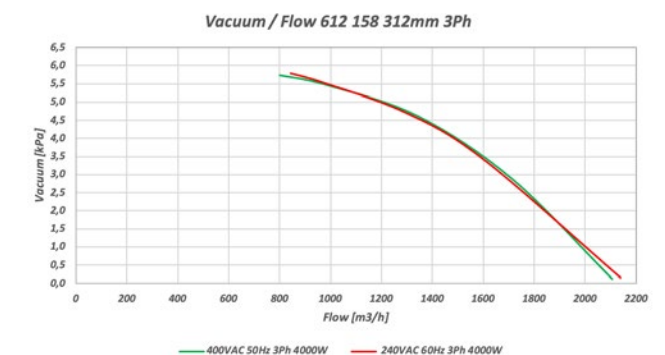
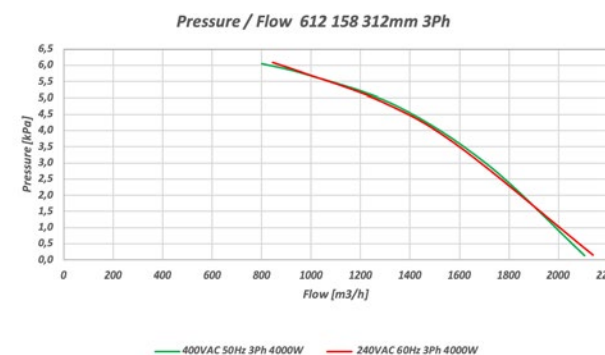
Mechanical options



See page 98 for Connector Harnesses

Pin Assignment					
Molex 1720430406		Molex 39-30-3055		Molex 39-30-3035	
Pin #	Function (Power)	Pin #	Function (Control)	Pin #	Function (status output)
1	A/C Input	1	15V-40V External Supply	1	Auxiliary 15VDC Output
2	A/C Input	2	Tach Output	2	Open Collector Output
3	A/C Input	3	Speed Command Input 0..10V	3	Common
4	Ground	4	n.c.		
		5	Common		

Characteristic diagram





- » High Speed BLDC Blower
- » Electronic Commutation
- » Hall Sensor Output
- » Aerodynamically Optimized

- » Compact and light weight
- » Low Sound Output
- » High Efficiency



Data		Std. Output		High Output
Nominal voltage	VDC	12	24	24
Fan housing diameter	mm	76	76	76
Fan stages	n°	1	1	1
Max. airflow	m³/h	44	44	49
Max. pressure	kPa	7.5	7.5	9.5
Max. Input power	W	110	110	130
Input current	A	9	4.5	5.5
Max. speed	rpm	37 000	37 000	40 000
Weight	Kg	0.25	0.25	0.25
Sound pressure level*	dBA	<73	<73	<73
Peak Total Efficiency	%	43	43	42

\* At free flow conditions according to IEC 60704-1

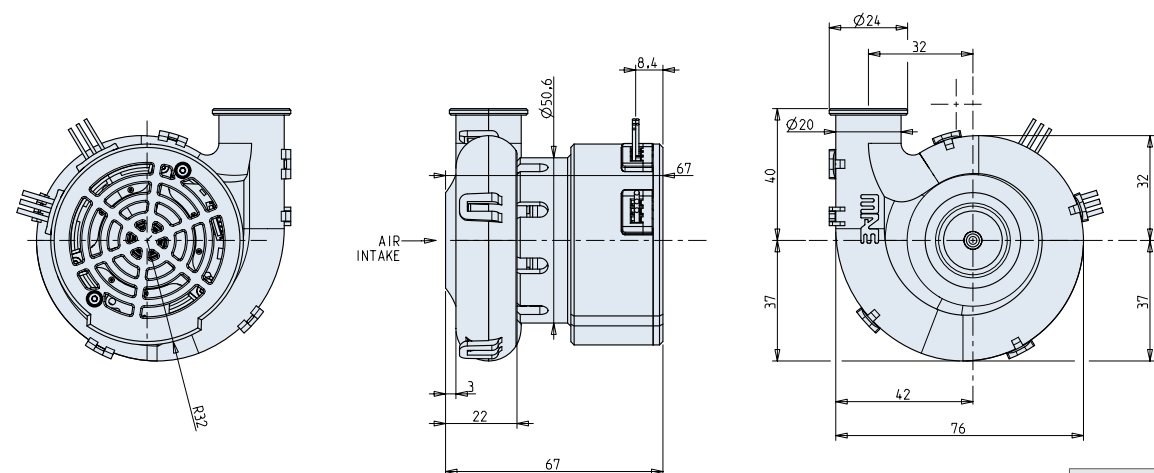
Alternative versions on request:

- » 36 VDC input
- » With on-board drive controller
- (dCore models require external drive controller)

Options on request:

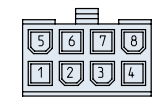
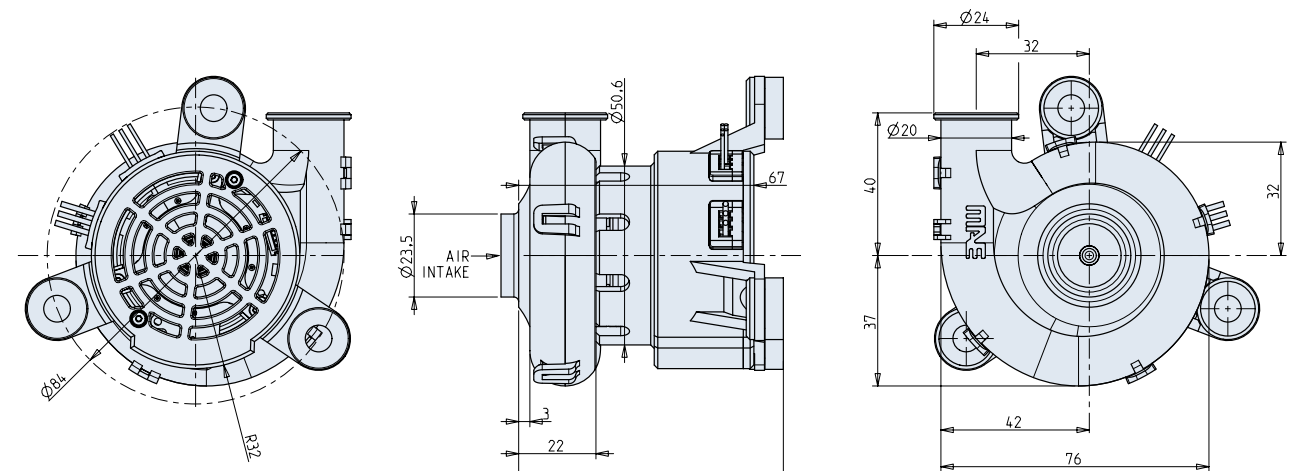
- » 8-pin connector
- » Mounting feet
- » Tube on working-air intake

Dimensions in mm/ standard models



Pin Out		
Phase A	Red	●
Phase B	Black	●
Phase C	Yellow	●
Hall Sensor		
VCC	Red	●
GND	Black	●
H1	Green	●
H2	Yellow	●
H3	Brown	●

Dimensions in mm/ models with optional mounting feet and connector plus working-air intake tube

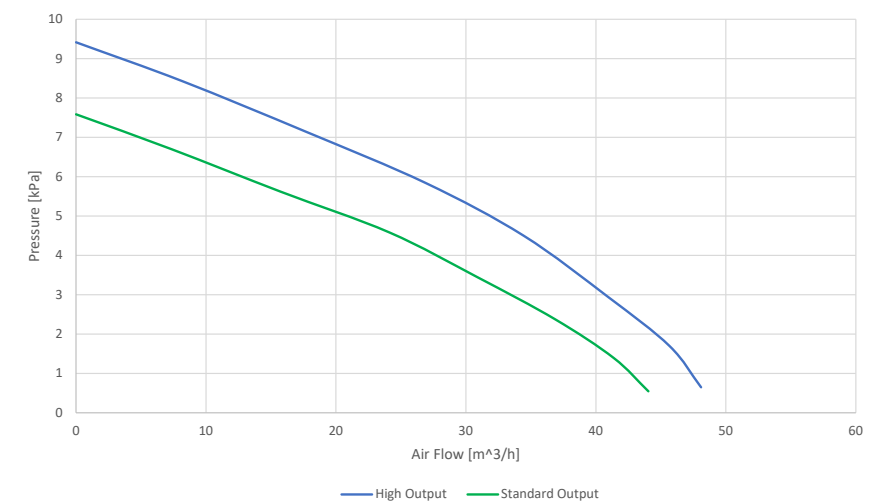


SCALE 2:1

Pin Assignment

Description	J1
Hall HA	1
Hall HB	2
VCC	3
Phase SHC	4
Hall HC	5
GND	6
Phase SHA	7
Phase SHB	8

Characteristic diagram



- » High Speed BLDC Blower
- » Sensorless Commutation
- » Onboard Speed Control
- » Tach Output

- » Aerodynamically Optimized
- » Compact and light weight
- » Low Sound Output
- » High Efficiency



Data			
Nominal voltage	VDC	12	24
Fan housing diameter	mm	76	76
Fan stages	n°	1	1
Max. airflow	m³/h	44	44
Max. pressure	kPa	7.5	7.5
Max. Input power	W	110	110
Input current	A	9	4.5
Max. speed	rpm	37 000	37 000
Weight	Kg	0.25	0.25
Sound pressure level*	dBA	<73	<73
Peak Total Efficiency	%	43	43

\* At free flow conditions according to IEC 60704-1

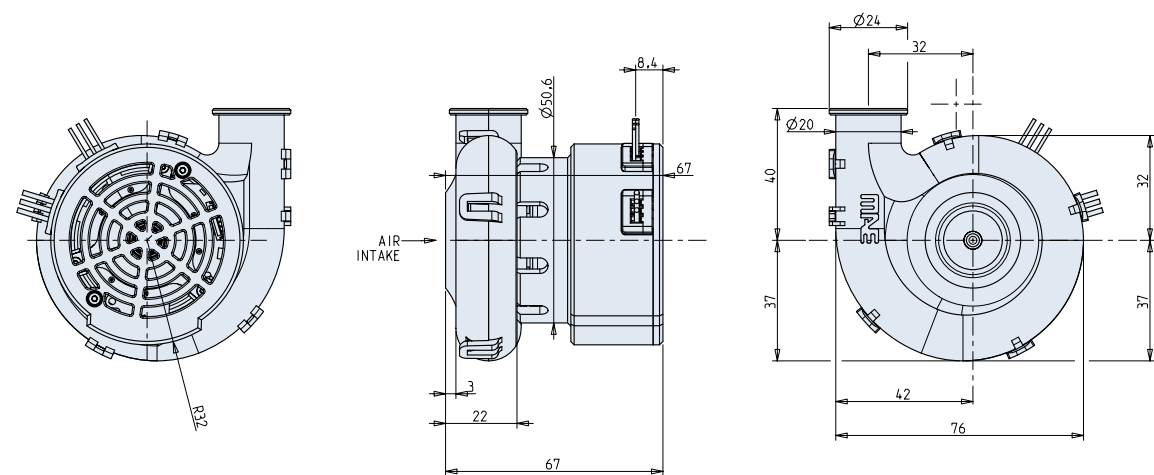
Standard Features:

- » Analogue speed command input 0-10 VDC
- » Tach-output 2 ppr

Options on request:

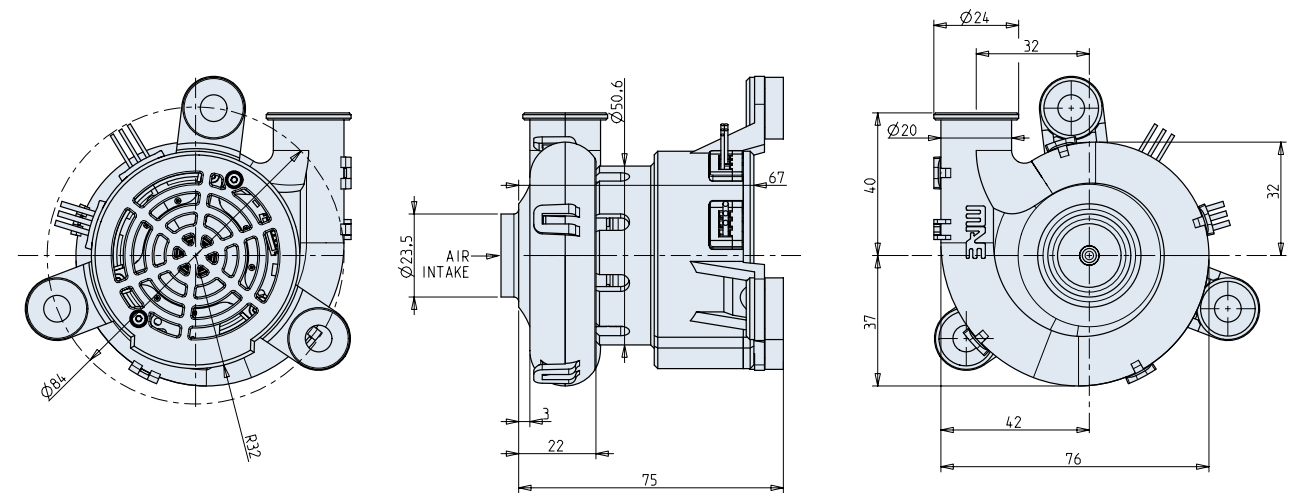
- » 4-pin connector
- » Mounting feet
- » Tube on working-air intake

Dimensions in mm/ standard models



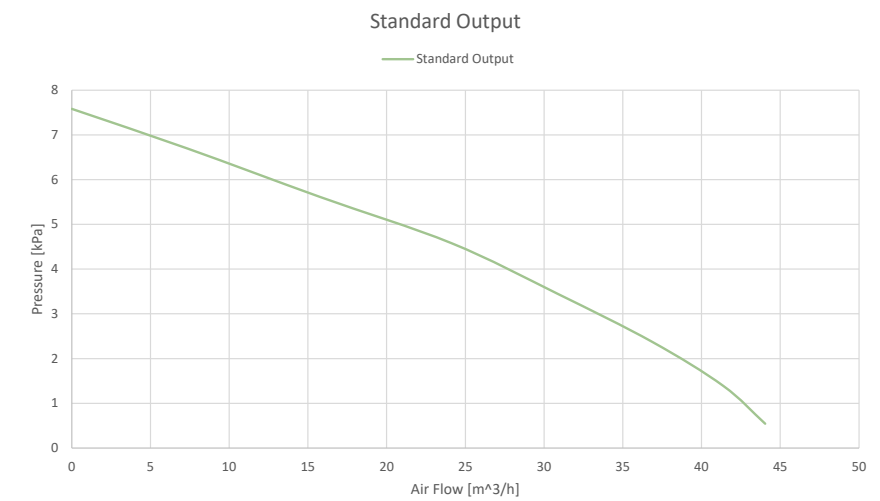
Lead-wire description		
VDC	Red	●
GND	Black	●
0-10 VDC speed control	Green	●
Tach out	Blue	●

Dimensions in mm/ models with optional mounting feet and working-air intake tube



Connection diagram		
VDC	Red	●
GND	Black	●
0-10 VDC speed control	Green	●
Tach out	Blue	●

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard drive control
- » Closed-Loop speed control
- » Aerodynamically optimized impeller and housing
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller

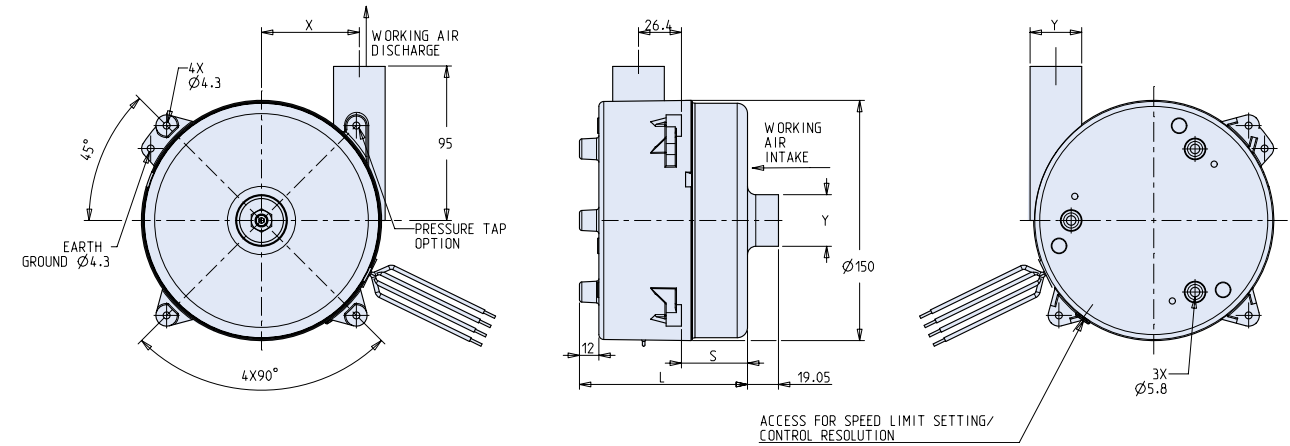


Data		1-Stage		2-Stage	
Nominal voltage	VDC	24	48	24	48
Fan housing diameter	mm	145	145	145	145
Fan stages	n°	1	1	2	2
Max. airflow	m³/h	230	190	123	146
Max. pressure	kPa	8.4	6.5	16	13.1
Max. vacuum	kPa	8	6	15	12.4
Input power	W	600	600	600	600
Current @ 120V	A	-	-	-	-
Current @ 230V	A	-	-	-	-
Current	A	19	9	18	8
Max. speed	rpm	19000	16500	19000	16500
Weight	Kg	2.7	2.7	2.7	2.7
<b>Standard Features</b>					
Speed command input	VDC	0-10	0-10	0-10	0-10
Tach output	ppr	2	2	2	2

- Options
- A) Mechanical
- » Enhanced corrosion protection
  - » No inlet tube on working air
  - » Cooling air inlet tube
  - » Various mounting patterns

- B) Electrical / Software
- » No options available

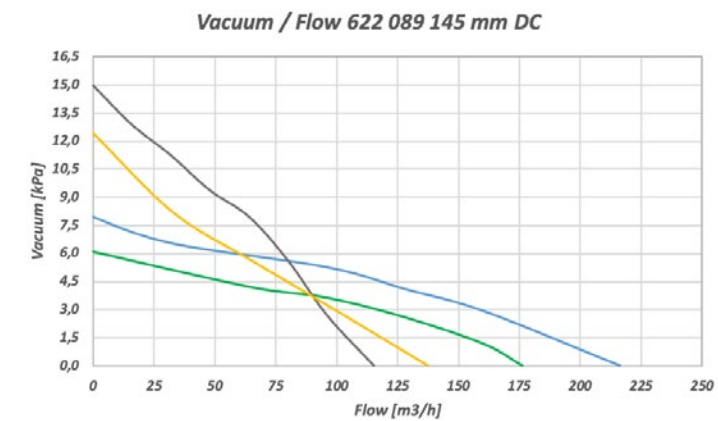
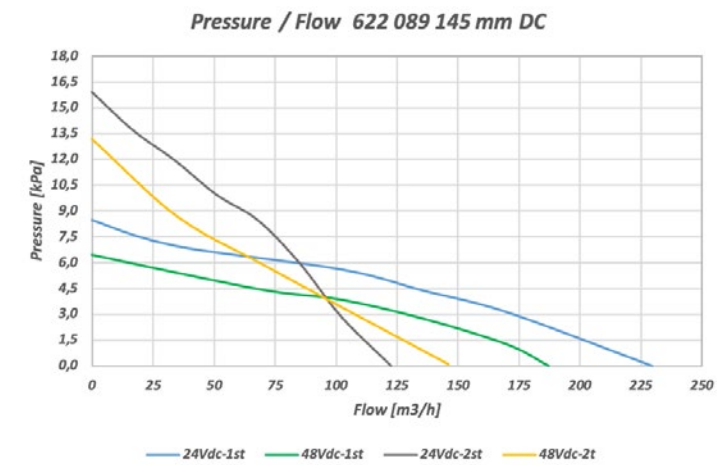
Dimensions in mm



Lead wires	
Colour	Function
Red ●	VDC
Black ●	Common
Orange ●	Speed command / 0-10VDC
Blue ●	Tach output

Blower	L	S	X	Y ø
1-stage	84	20.6	53.8	44.5
2-Stage	104	40.6	60.2	44.5

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard drive control
- » Closed-Loop speed control
- » Aerodynamically optimized impeller and housing
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller

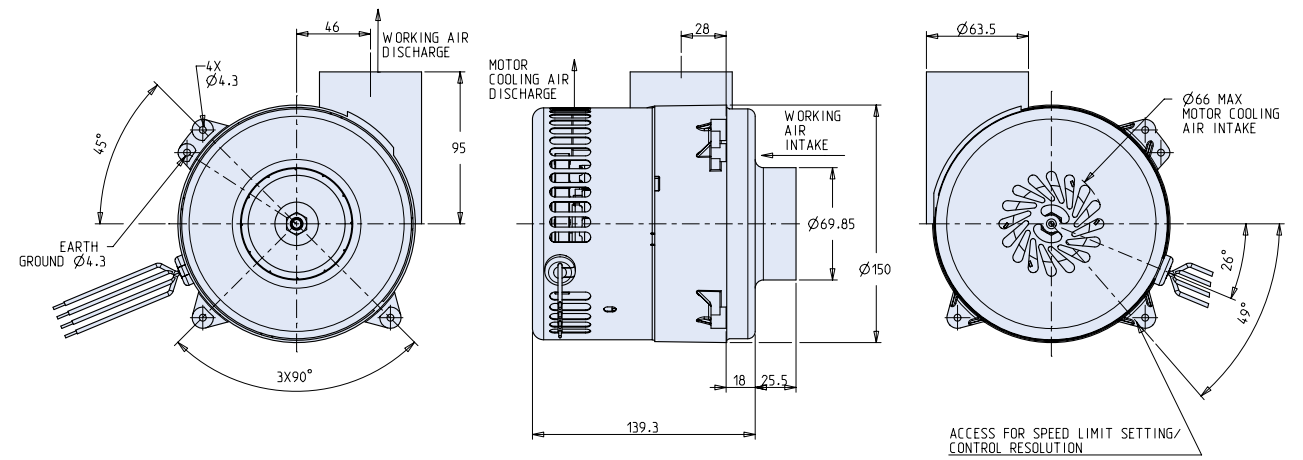


Data		24 V	48 V
Nominal voltage	VDC	24	48
Fan housing diameter	mm	145	145
Fan stages	n°	1	1
Max. airflow	m³/h	319	275
Max. pressure	kPa	5.4	5
Max. vacuum	kPa	5.1	4.7
Input power	W	600	600
Current	A	20	8
Max. speed	rpm	17500	17500
Weight	Kg	2.7	2.7
<b>Standard Features</b>			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

- A) Mechanical
  - » Enhanced corrosion protection
  - » No inlet tube on working air
  - » Cooling air inlet tube
  - » Various mounting patterns
- B) Electrical / Software
  - » No options available

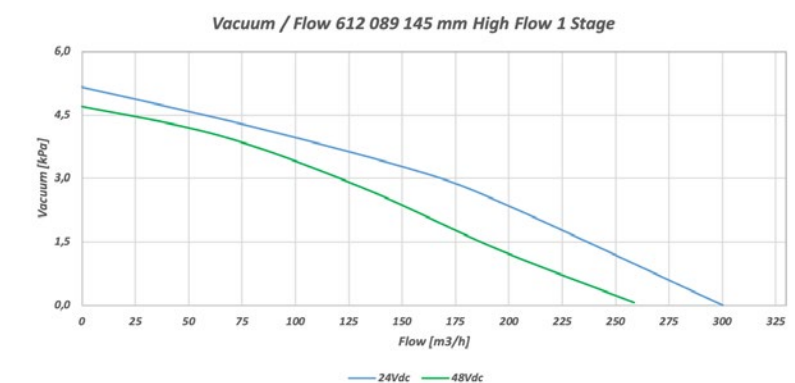
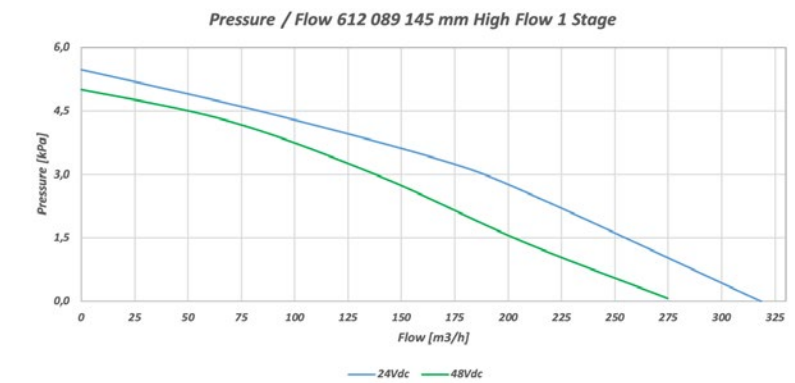
Dimensions in mm



Lead wires	
Colour	Function
Red	VDC
Black	Common
Orange	Speed command
Blue	Tach Output

See page 51 for Mechanical Options

Characteristic diagram



- » BLDC Blower / Electronically Commutated
- » Onboard drive control
- » Closed-Loop speed control
- » Aerodynamically optimized impeller and housing
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller

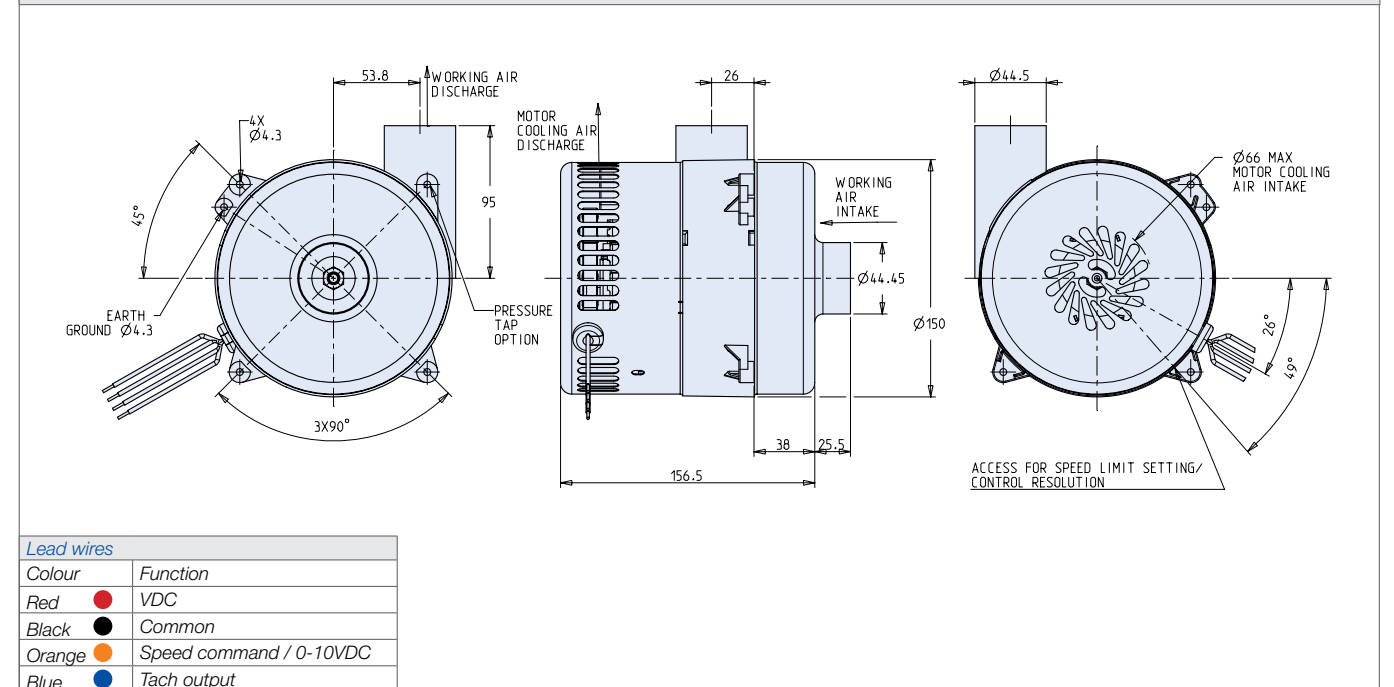


Data		24 V	48 V
Nominal voltage	VDC	24	48
Fan housing diameter	mm	145	145
Fan stages	n°	2	2
Max. airflow	m³/h	170	150
Max. pressure	kPa	14.5	12.4
Max. vacuum	kPa	13.6	11.6
Input power	W	600	600
Current	A	20	9
Max. speed	rpm	17500	16500
Weight	Kg	2.7	2.7
<b>Standard Features</b>			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

- Options
- A) Mechanical
- » Enhanced corrosion protection
  - » No inlet tube on working air
  - » Cooling air inlet tube
  - » Various mounting patterns

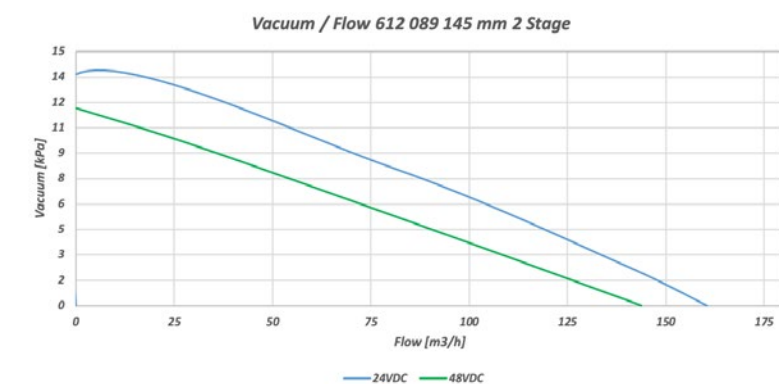
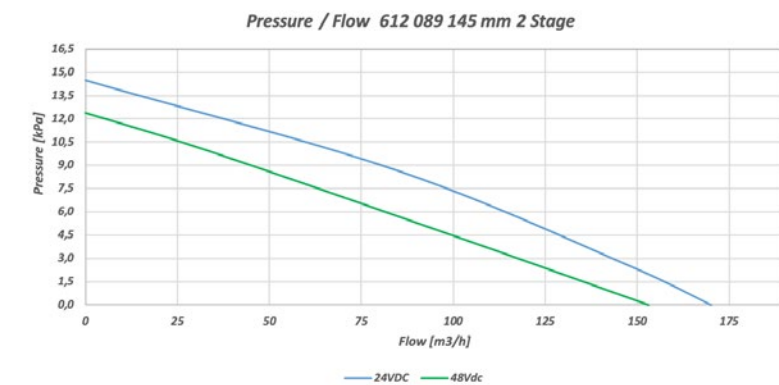
- B) Electrical / Software
- » No options available

Dimensions in mm



See page 51 for Mechanical Options

Characteristic diagram





- » BLDC Blower / Electronically Commutated
- » Onboard drive control
- » Closed-Loop speed control
- » Aerodynamically optimized impeller and housing
- » Onboard calibration potentiometer
- » Robust aluminium housing and impeller



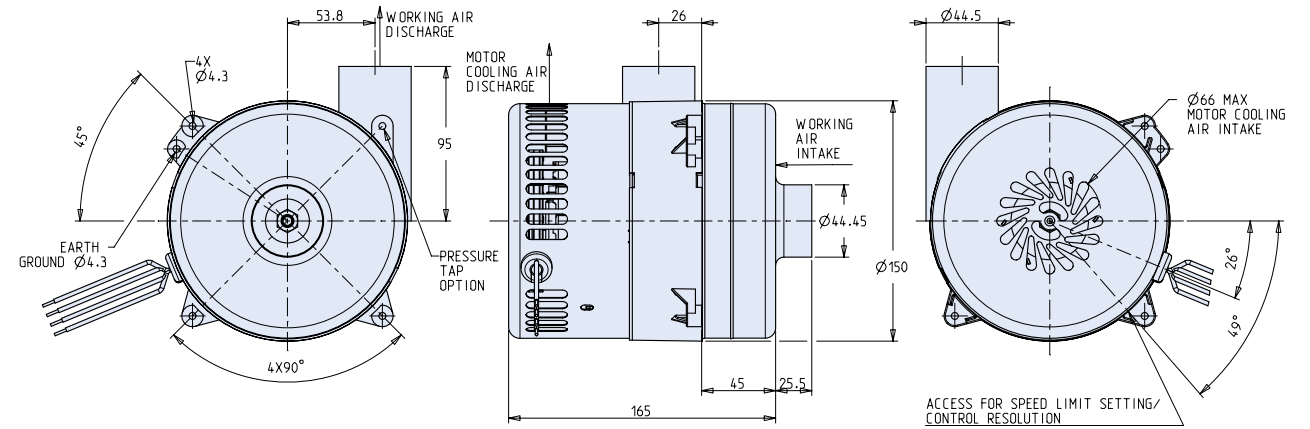
Data		24 V	48 V
Nominal voltage	VDC	24	48
Fan housing diameter	mm	145	145
Fan stages	n°	3	3
Max. airflow	m³/h	110	109
Max. pressure	kPa	20.5	19.6
Max. vacuum	kPa	19.5	18.5
Input power	W	600	600
Current	A	20	9
Max. speed	rpm	17000	16500
Weight	Kg	2.7	2.7
<b>Standard Features</b>			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

**Options**

- A) Mechanical**
- » Enhanced corrosion protection
  - » No inlet tube on working air
  - » Cooling air inlet tube
  - » Various mounting patterns

- B) Electrical / Software**
- » No options available

**Dimensions in mm**

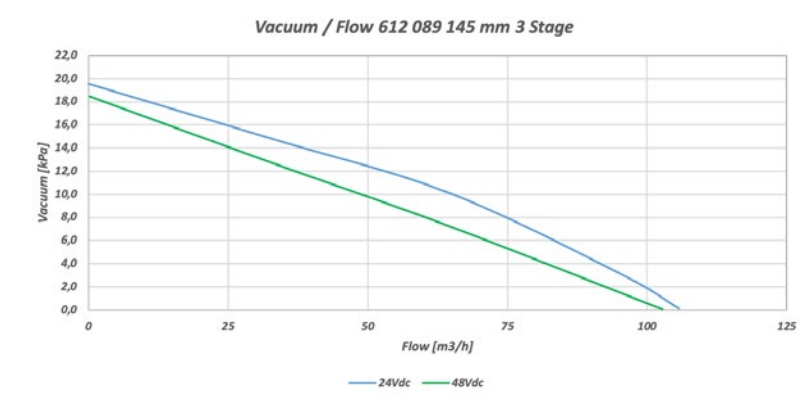
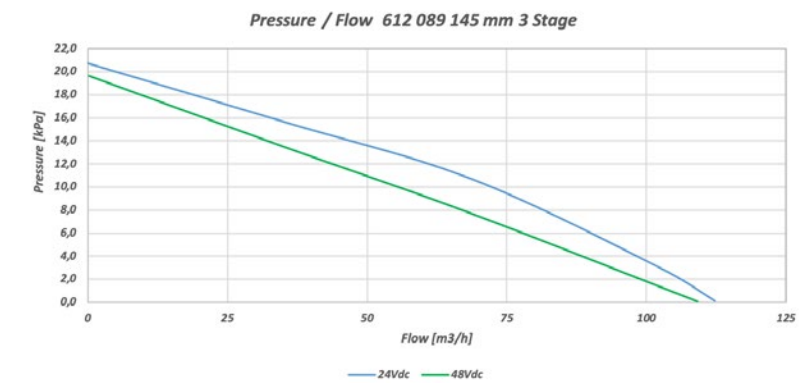


**Lead wires**

Colour	Function
Red ●	VDC
Black ●	Common
Orange ●	Speed command / 0-10VDC
Blue ●	Tach output

See page 51 for Mechanical Options

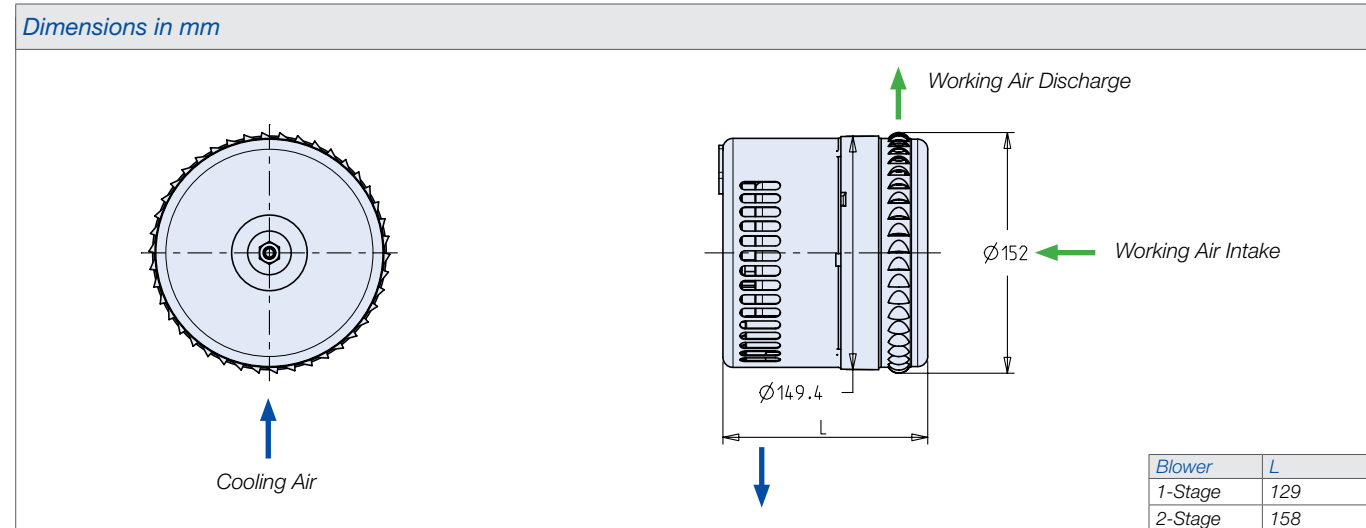
**Characteristic diagram**



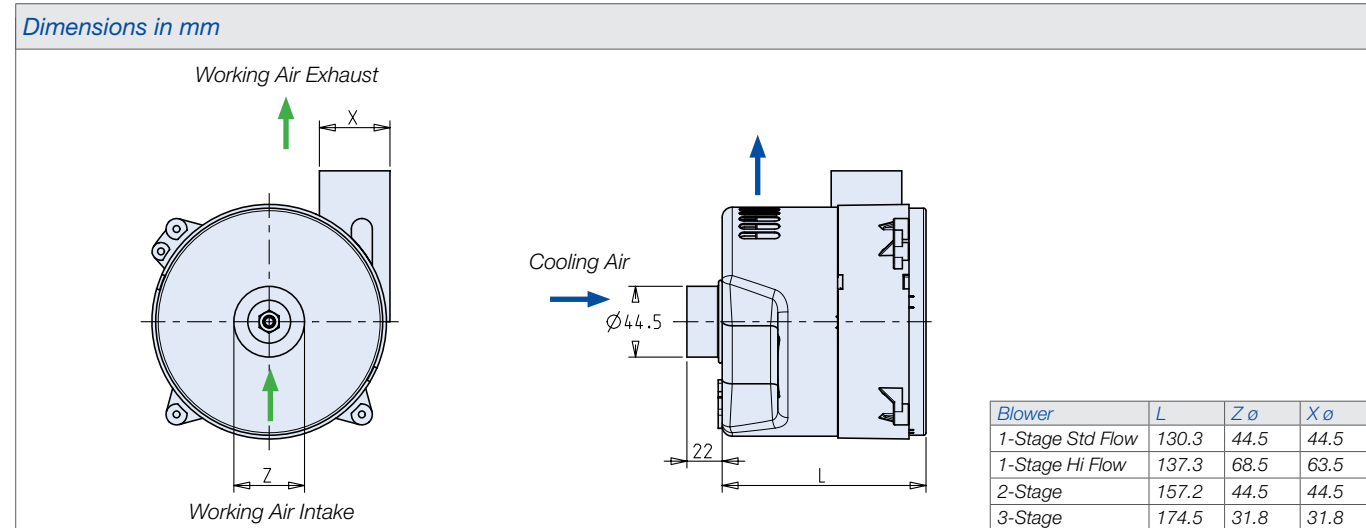
## >> BB 89 AC 145 mm | Mechanical Options

» Below mechanical options are available for all Blower series BB 145 mm AC

### Peripheral working air discharge



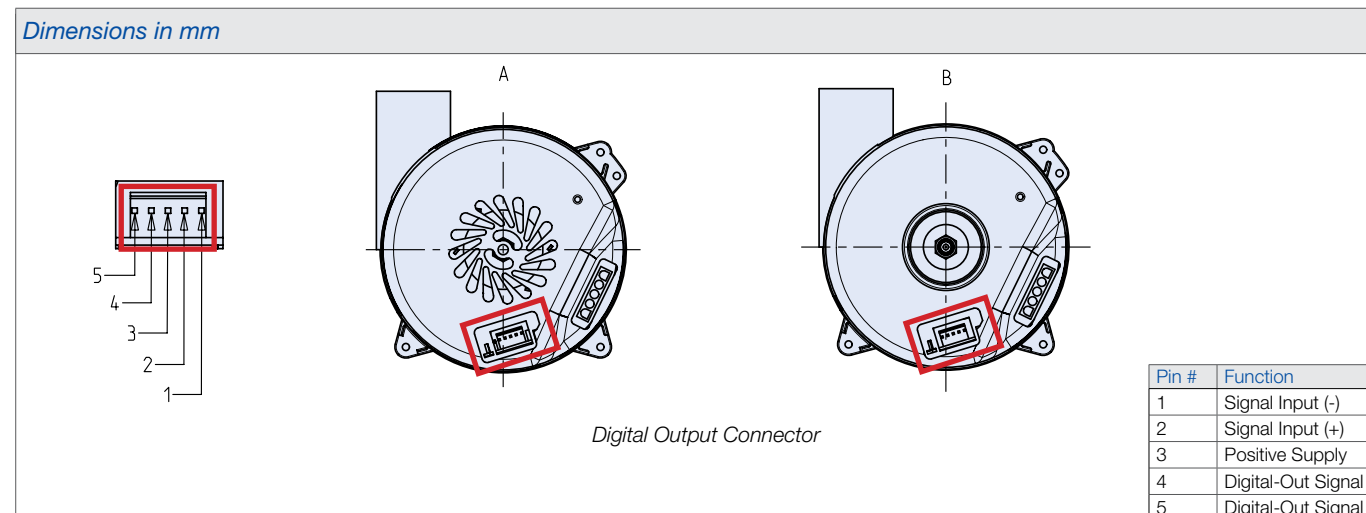
### Working air without intake tube and cooling air with intake tube



## >> BB 89 145mm AC Digital Output

» A Digital Output option is available for all Blower series BB 145 mm AC

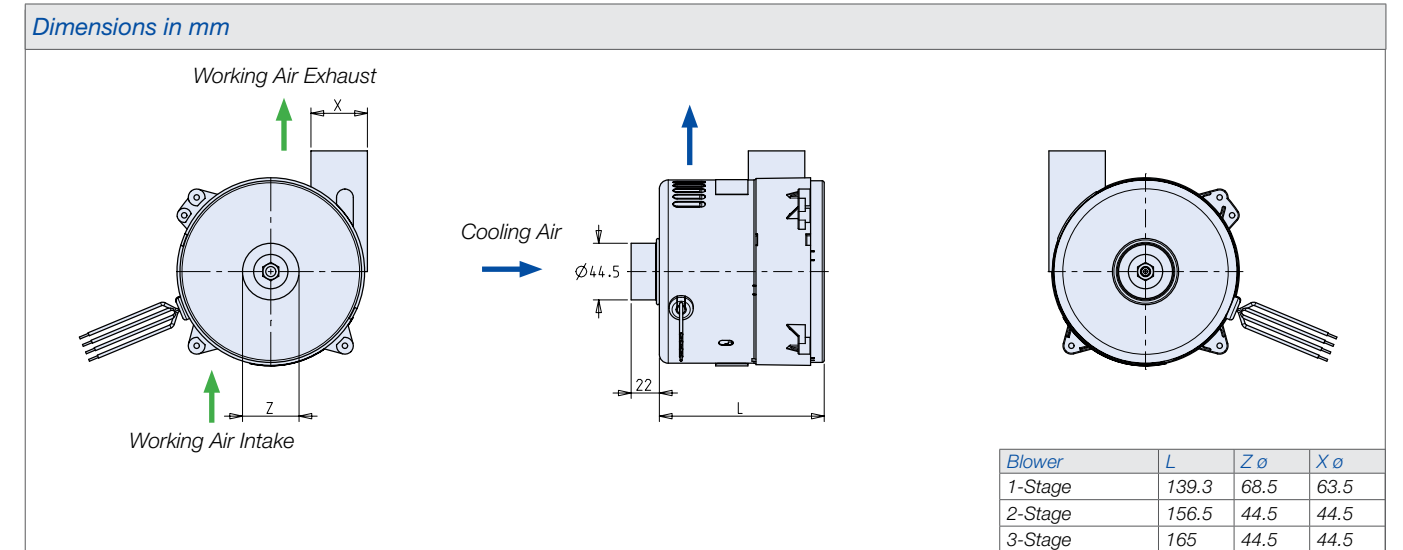
Digital Output and Pin Assignment shown without cooling air intake tube (A) and with cooling air intake tube (B)



## >> BB 89 DC 145 mm | Mechanical Options

» Below mechanical options are available Blower series BB 145 mm DC

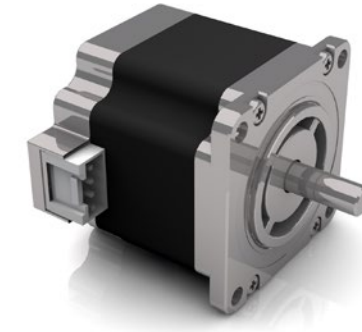
### Working air without intake tube and cooling air with intake tube





# Stepper Motors

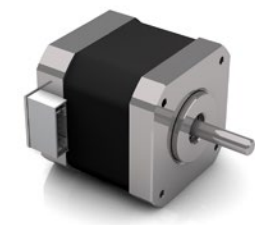
## » Series ST



Stepper Motors	
Page 56	ST 17   Nema 17 Stepper Motor
Page 58	ST 23   Nema 23 Stepper Motor
Page 60	ST 34   Nema 34 Stepper Motor
Page 62	ST 17 <b>sGo</b>   Nema 17 Stepper Motor with integrated controller
Page 63	ST 23 <b>sGo</b>   Nema 17 Stepper Motor with integrated controller
Page 64	ST 17 CO/MB   Nema 17 Stepper Motor with integrated controller
Page 66	ST 23 CO/MB/EC   Nema 23 Stepper Motor with integrated controller
Page 68	ST 34 CO/MB/EC   Nema 34 Stepper Motor with integrated controller

- » 2 Phase Hybrid Stepper
- » 1.8° step angle (+/-5%)
- » 42 mm square Nema 17
- » High grade Neodymium magnets
- » Customized solutions available on demand
- » Operating temperatures -20°C to +40°C

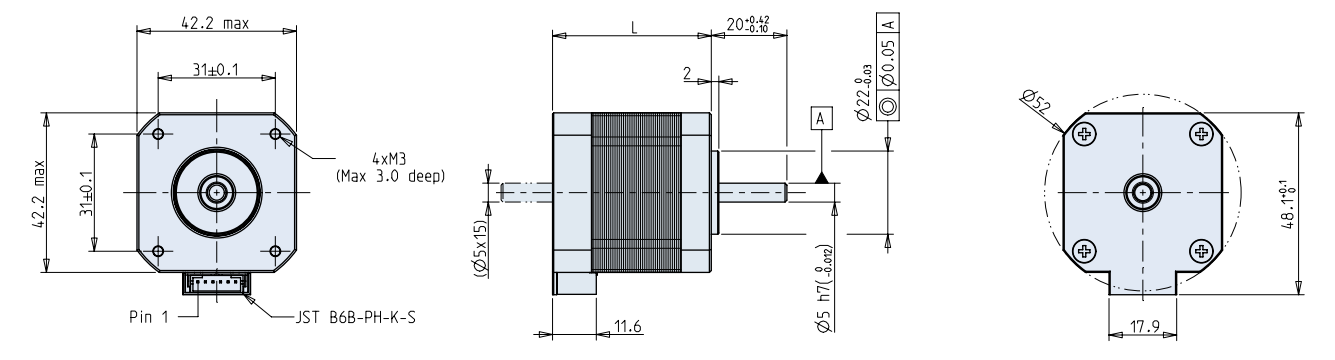
- » Sinusoidal back-EMF optimized for microstep operation and high holding torque
- » Insulation Class 130 (B)
- » With external STE controller on request
- » For stock program please go to [www.dunkermotoren.com/en/configuration](http://www.dunkermotoren.com/en/configuration)



Data		ST 17x14			ST 17x16			ST 17x20			ST 17x24		
Rated phase current	A	0.40	1.00	1.50	0.40	1.00	2.00	0.40	1.00	2.00	0.40	1.00	2.00
Phase resistance	Ohm	16.340	3.450	1.390	20.070	3.360	0.860	24.880	3.870	1.090	28.500	4.600	1.240
Phase inductance	mH	21.80	4.82	1.60	37.18	6.35	1.49	43.80	7.05	1.64	62.20	10.80	2.52
Holding torque bipolar	Ncm	27.00	29.00	28.00	42.00	44.00	42.00	57.00	57.00	57.00	76.00	79.00	75.00
Detent torque	Ncm	1.40	1.40	1.40	2.00	2.00	2.00	2.50	2.50	2.50	3.00	3.00	3.00
Rotor inertia	gcm <sup>2</sup>	39.50	39.50	39.50	57.00	57.00	57.00	83.40	83.40	83.40	114.00	114.00	114.00
Max. voltage	VDC	50	50	50	50	50	50	50	50	50	50	50	50
Weight	Kg	0.260	0.260	0.260	0.320	0.320	0.320	0.420	0.420	0.420	0.470	0.470	0.470

All data measured with standard cables 300 mm at 25°C

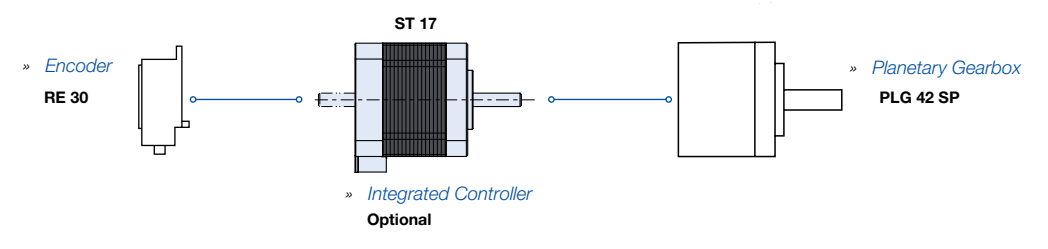
Dimensions in mm



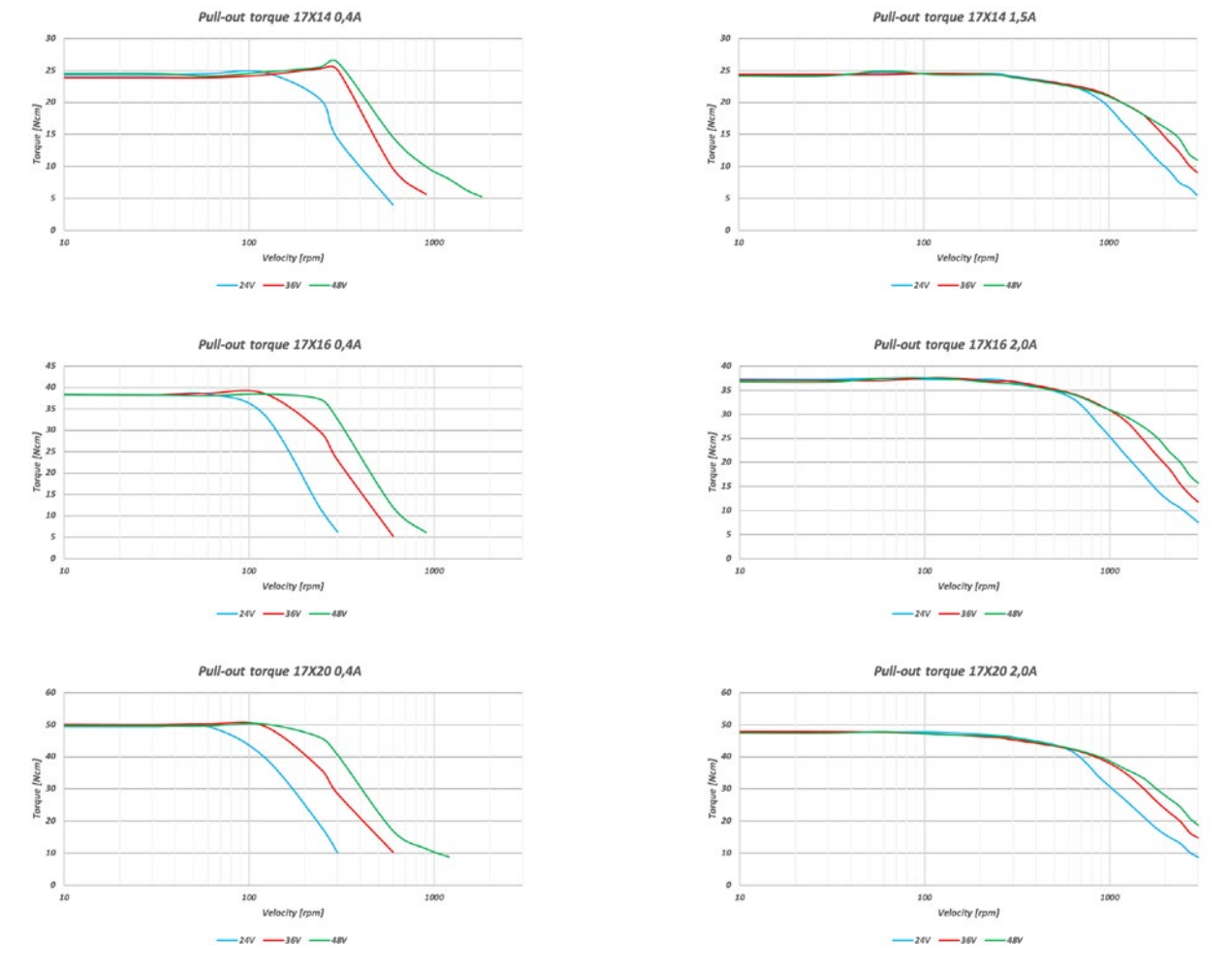
Motor	L	
17x14	36.3±0.6	» Shaft D-cut option: 4.5X15 mm
17x16	42.0±0.6	» Radial connector available upon request
17x20	53.0±0.6	» Optional Rear-Flange with centering collar 16 mm, subcircuit 22 mm M3
17x24	62.0±0.6	

See page 96 for Connector Harness

Modular System

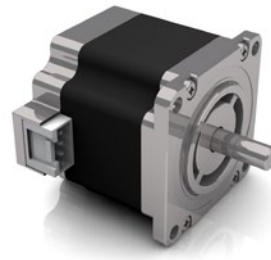


Characteristic diagram



- » 57 mm square Nema 23
- » Hi grade Neodymium magnets
- » 1.8° step angle (+/-5%)
- » Customized solutions available on demand
- » Operating temperatures -20°C to +40°C

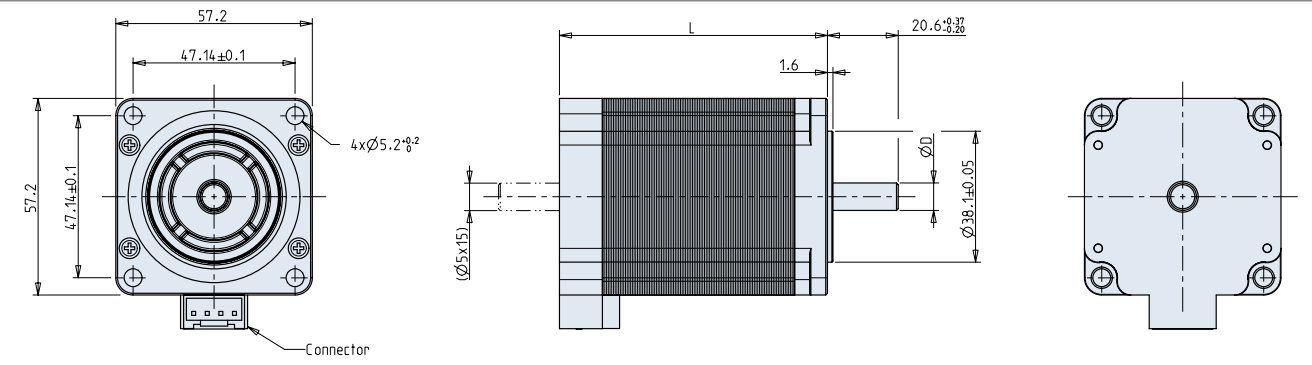
- » Sinusoidal back-EMF optimized for microstep operation and hi holding torque
- » Insulation Class 130 (B)
- » With external STE controller on request
- » For stock program please go to [www.dunkermotoren.com/en/configuration](http://www.dunkermotoren.com/en/configuration)



Data		ST 23x16			ST 23x21			ST 23x31			
Rated phase current	A	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	4.00
Phase resistance	Ohm	3.670	0.980	0.420	5.140	1.330	0.610	6.260	1.570	0.690	0.430
Phase inductance	mH	13.51	3.21	1.58	20.75	5.67	2.30	22.35	5.77	2.70	1.66
Holding torque Bipolar	Ncm	70.00	70.00	70.00	140.00	140.00	140.00	200.00	200.00	200.00	210.00
Detent torque	Ncm	3.00	3.00	3.00	5.00	5.00	6.00	8.00	7.00	7.00	7.00
Rotor inertia	gcm <sup>2</sup>	77.00	77.00	77.00	209.00	209.00	209.00	335.00	335.00	335.00	335.00
Max. voltage	VDC	75	75	75	75	75	75	75	75	75	75
Weight	Kg	0.460	0.460	0.460	0.700	0.700	0.700	1.050	1.050	1.05	1.05

All data measured with standard cables 300 mm at 25°C

Dimensions in mm

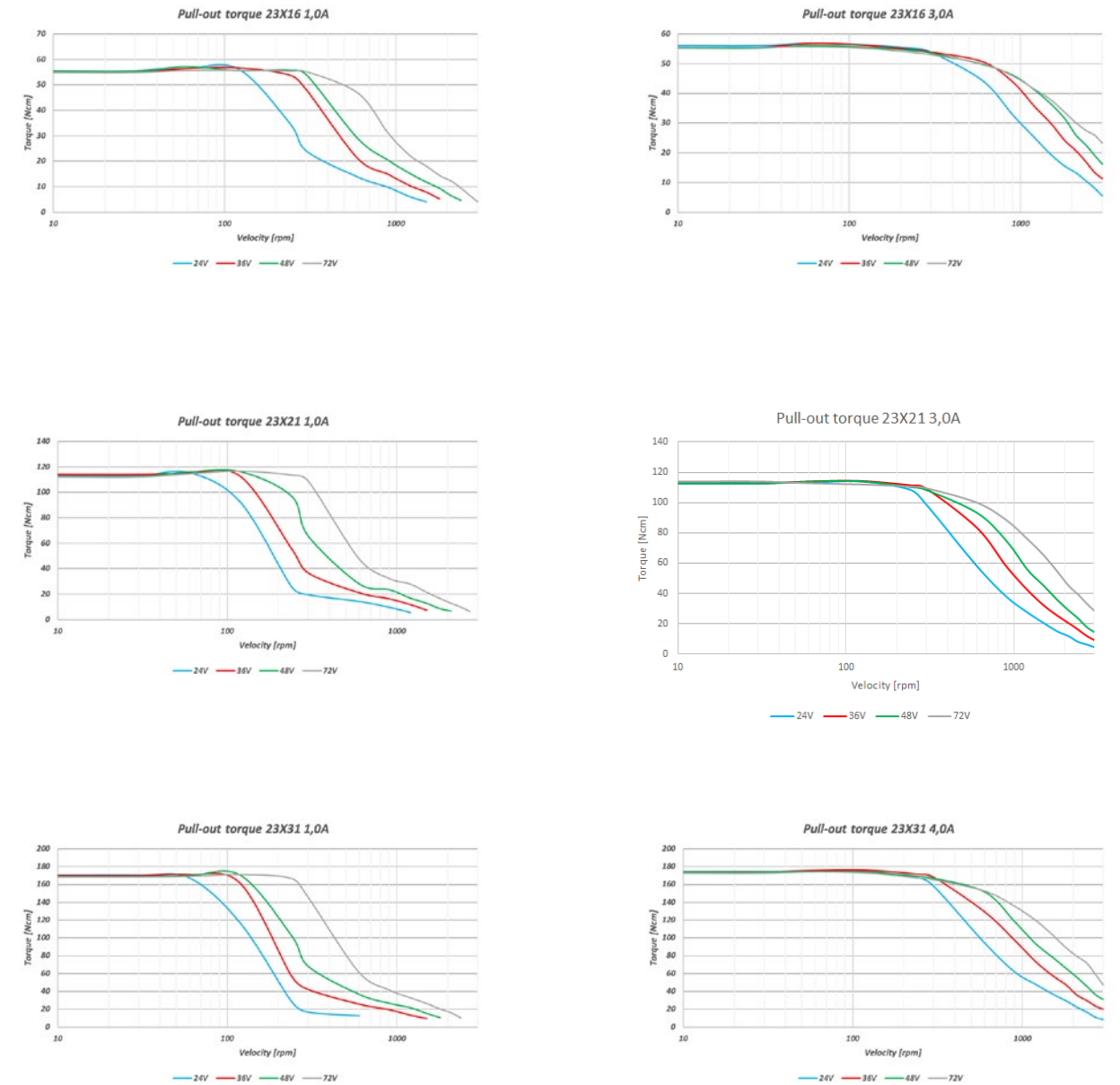


- » Shaft D-cut options: 5.8x15 mm or 7.5x15mm
- » Optional Rear-Flange with centering collar 22 mm, subcircuit 32 mm M3

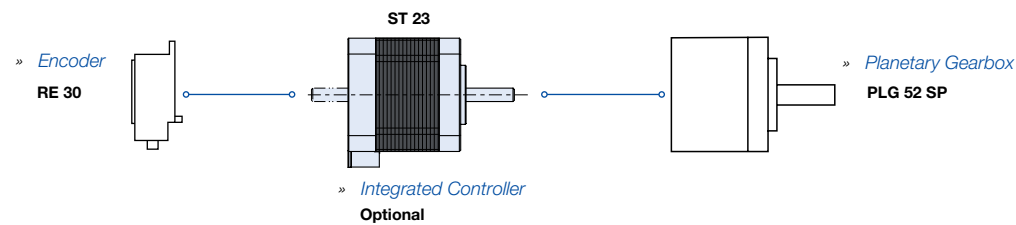
Motor	L	D ø
23X16	40±0.6	6.35
23X21	55±0.6	6.35
23X31	78±0.6	8

See page 96 for Connector Harness

Characteristic diagram



Modular System





- » 86 mm square Nema 34
- » High grade Neodymium magnets
- » 1.8° step angle (+/-5%)
- » Customized solutions available on demand
- » Operating temperatures -20°C to +40°C

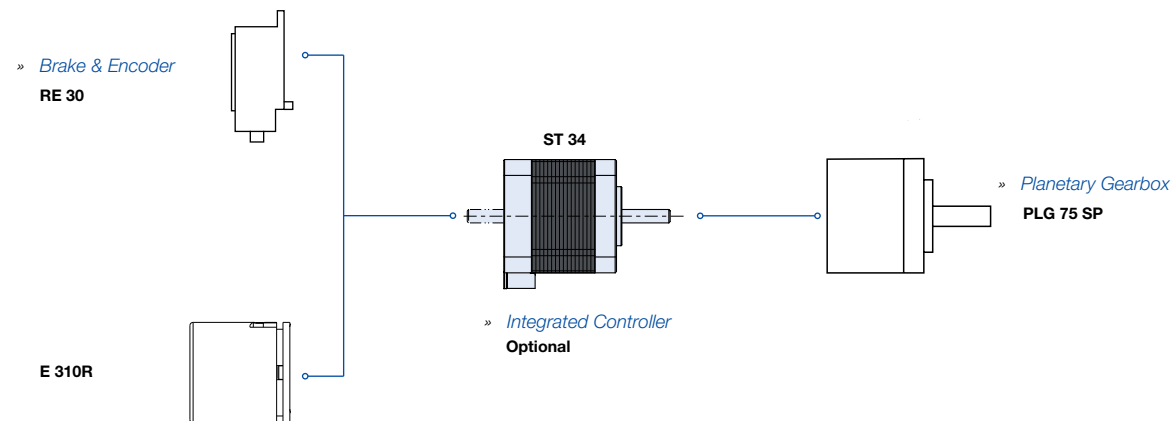
- » Sinusoidal back-EMF optimized for microstep operation and hi holding torque
- » Insulation Class 130 (B)
- » With external STE controller on request
- » For stock program please go to [www.dunkermotoren.com/en/configuration](http://www.dunkermotoren.com/en/configuration)



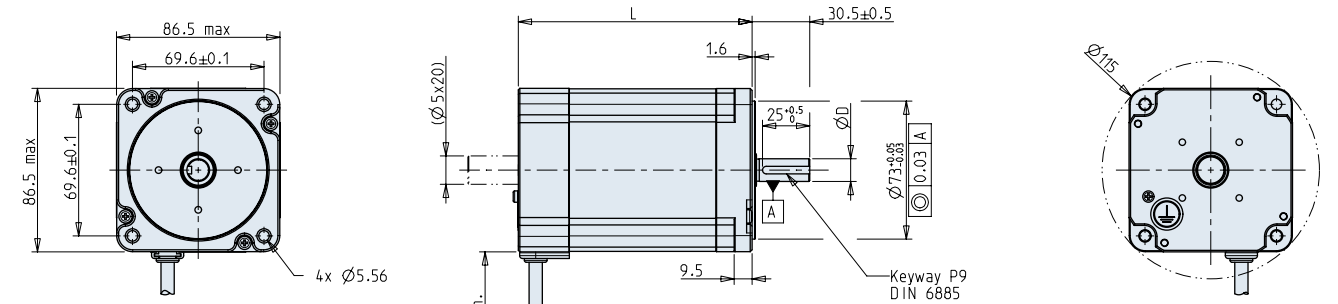
Data		ST 34x37			ST 34x48			ST 34x55			ST 34x62
Rated phase current	A	3.00	5.50	8.00	3.00	5.50	8.00	3.00	5.50	8.00	8.00
Phase resistance	Ohm	1.240	0.420	0.200	1.500	0.465	0.215	1.700	0.550	0.290	0.330
Phase inductance	mH	12.00	3.60	1.65	12.96	4.00	1.85	20.00	5.60	2.60	2.88
Holding torque Bipolar	Ncm	520.00	550.00	550.00	700.00	700.00	700.00	1000.00	1000.00	1000.00	1200.00
Detent torque	Ncm	20.00	20.00	20.00	20.00	20.00	20.00	30.00	30.00	30.00	35.00
Rotor inertia	gcm <sup>2</sup>	2860.00	2860.00	2860.00	4732.00	4732.00	4732.00	6018.00	6018.00	6018.00	7030.00
Max. voltage	VDC	160	160	160	160	160	160	160	160	160	160
Weight	Kg	3.000	3.000	3.000	4.000	4.000	4.000	4.600	4.600	4.600	5.400

All data measured with standard cables 500 mm at 25°C

Modular System



Dimensions in mm

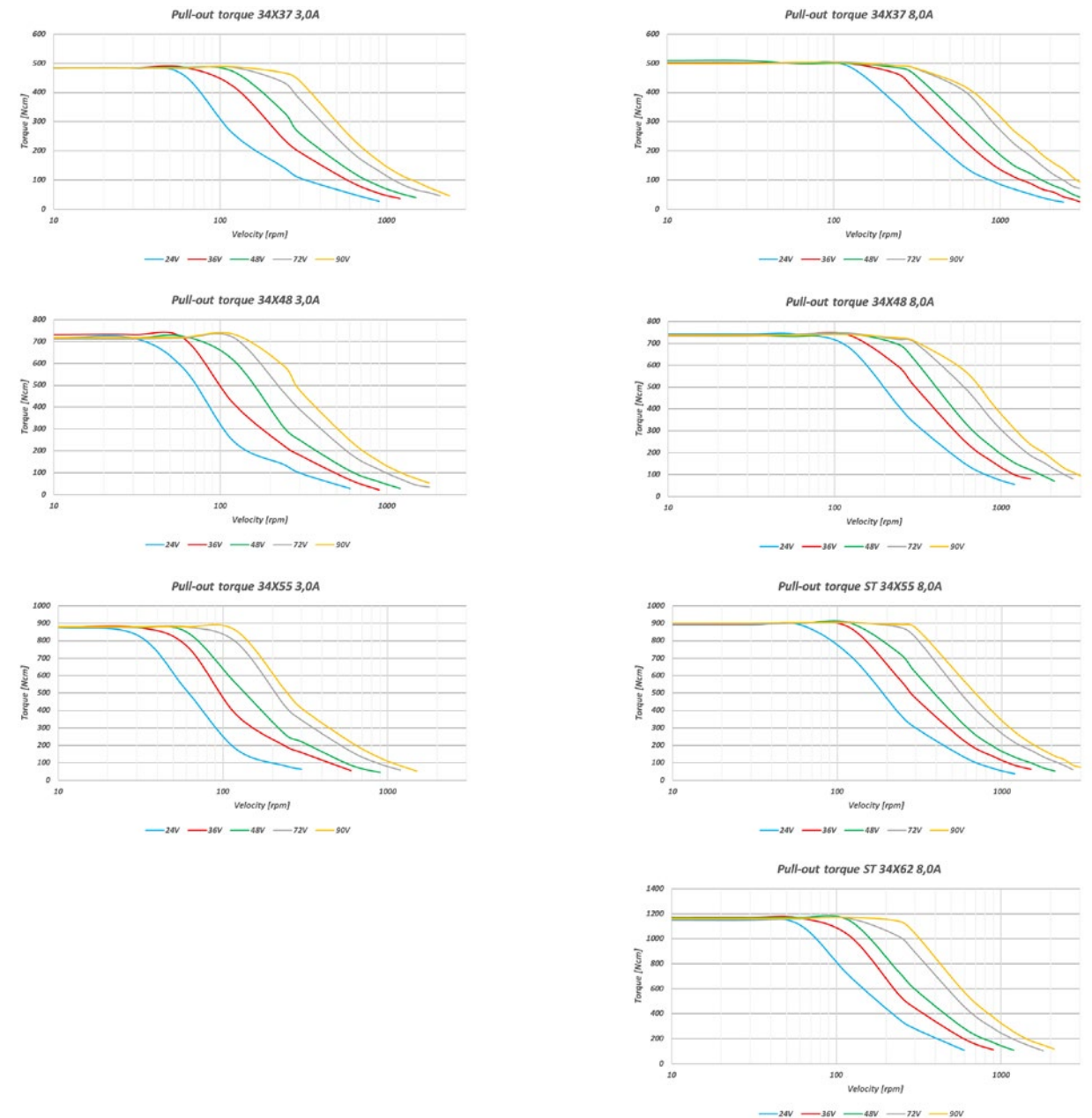


Colour	Function
White	phase A+
Yellow	phase A-
Red	phase B+
Blue	phase B-

» Optional Rear-Flange with centering collar 32 mm, subcircuit 45 mm M5

Motor	L	D ø	Keyway
34X37	96±0.6	12	4x4 P9
34X48	124±0.6	12	4x4 P9
34X55	141.5±0.6	12	4x4 P9
34X62	158.5±0.6	16	5x5 P9

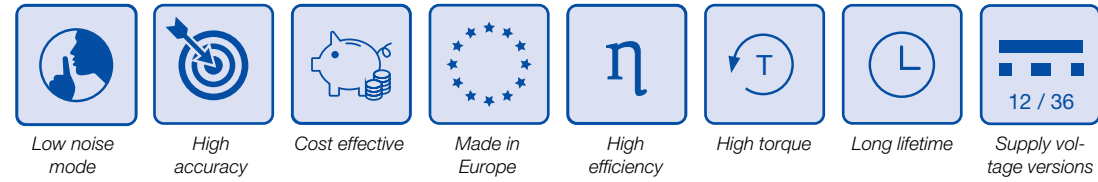
Characteristic diagram



## >> ST 17 sGo | Nema 17 Stepper Motor with integrated controller

- » European development and production
- » Simple and precise
- » Long lifetime
- » Cost-effective
- » Low Noise / Low Vibration due to 256 Microsteps per full step

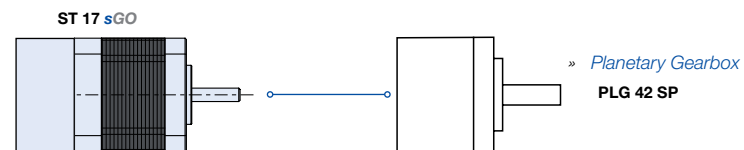
- » Step and direction
- » Input step resolution scalable from 8 to 64 steps
- » Energy efficiency through adjustable current
- » High accuracy



Data		ST 17x14			ST 17x16			ST 17x20			ST 17x24		
Rated phase current	A	0.40	1.00	1.50	0.40	1.00	2.00	0.40	1.00	2.00	0.40	1.00	2.00
Holding torque bipolar	Ncm	27.00	29.00	28.00	42.00	44.00	42.00	57.00	57.00	57.00	76.00	79.00	75.00
Detent torque	Ncm	1.40	1.40	1.40	2.00	2.00	2.00	2.50	2.50	2.50	3.00	3.00	3.00
Rotor inertia	gcm <sup>2</sup>	39.50	39.50	39.50	57.00	57.00	57.00	83.40	83.40	83.40	114.00	114.00	114.00
Max. voltage	VDC	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36
Weight	Kg	0.535	0.535	0.535	0.595	0.595	0.595	0.695	0.695	0.695	0.745	0.745	0.745

All data measured with standard cables 300 mm at 25°C

### Modular System

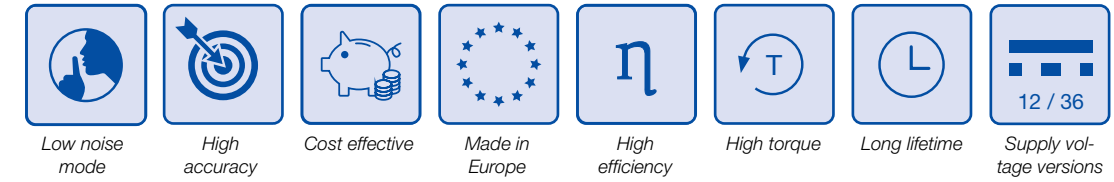
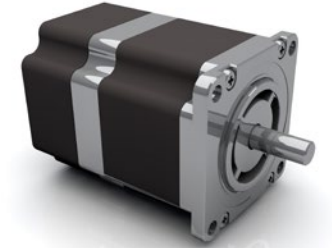


## >> ST 23 sGo | Nema 23 Stepper Motor with integrated controller



- » European development and production
- » Simple and precise
- » Long lifetime
- » Cost-effective
- » Low Noise / Low Vibration due to 256 Microsteps per full step

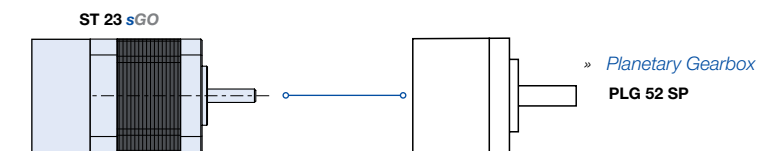
- » Step and direction
- » Input step resolution scalable from 8 to 64 steps
- » Energy efficiency through adjustable current
- » High accuracy



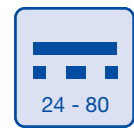
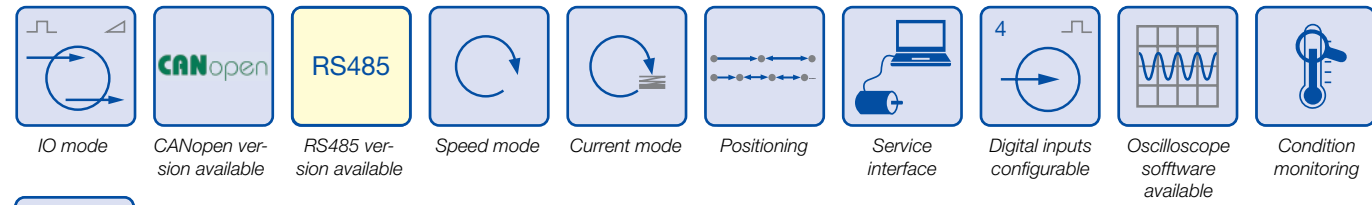
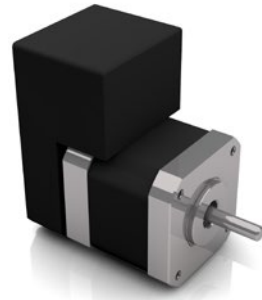
Data		ST 23x16			ST 23x21			ST 23x31			
Rated phase current	A	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	4.00
Holding torque Bipolar	Ncm	70.00	70.00	70.00	140.00	140.00	140.00	200.00	200.00	200.00	210.00
Detent torque	Ncm	3.00	3.00	3.00	5.00	5.00	6.00	8.00	7.00	7.00	7.00
Rotor inertia	gcm <sup>2</sup>	77.00	77.00	77.00	209.00	209.00	209.00	335.00	335.00	335.00	335.00
Max. voltage	VDC	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36	24/36
Weight	Kg	0.805	0.805	0.805	1.045	1.045	1.045	1.395	1.395	1.395	1.395

All data measured with standard cables 300 mm at 25°C

### Modular System



- » 2 phase Stepper Motor 1.8° step angle with integrated controller
- » 12-bit absolute magnetic encoder (single turn)
- » CANopen interface CiA 301 and CiA 402
- » Options available: EtherCAT version, Modbus RTU on RS485 version
- » Configurable resolution microstep/rev (400 to 204 800), Max. velocity 300 000 microstep/sec
- » Step accumulation with recovery (no step-loss)
- » 32 programmable cycles and 10 programmable sequences including jog (velocity), indexer (position), homing, marker (rotating table)
- » Linear, parabolic and s-curve profiles
- » Commissioning software
- » Configurable digital and analogue I/Os

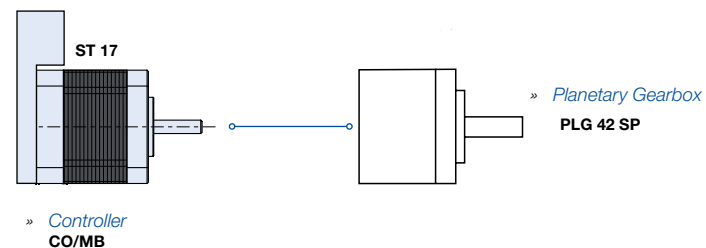


Supply voltage versions

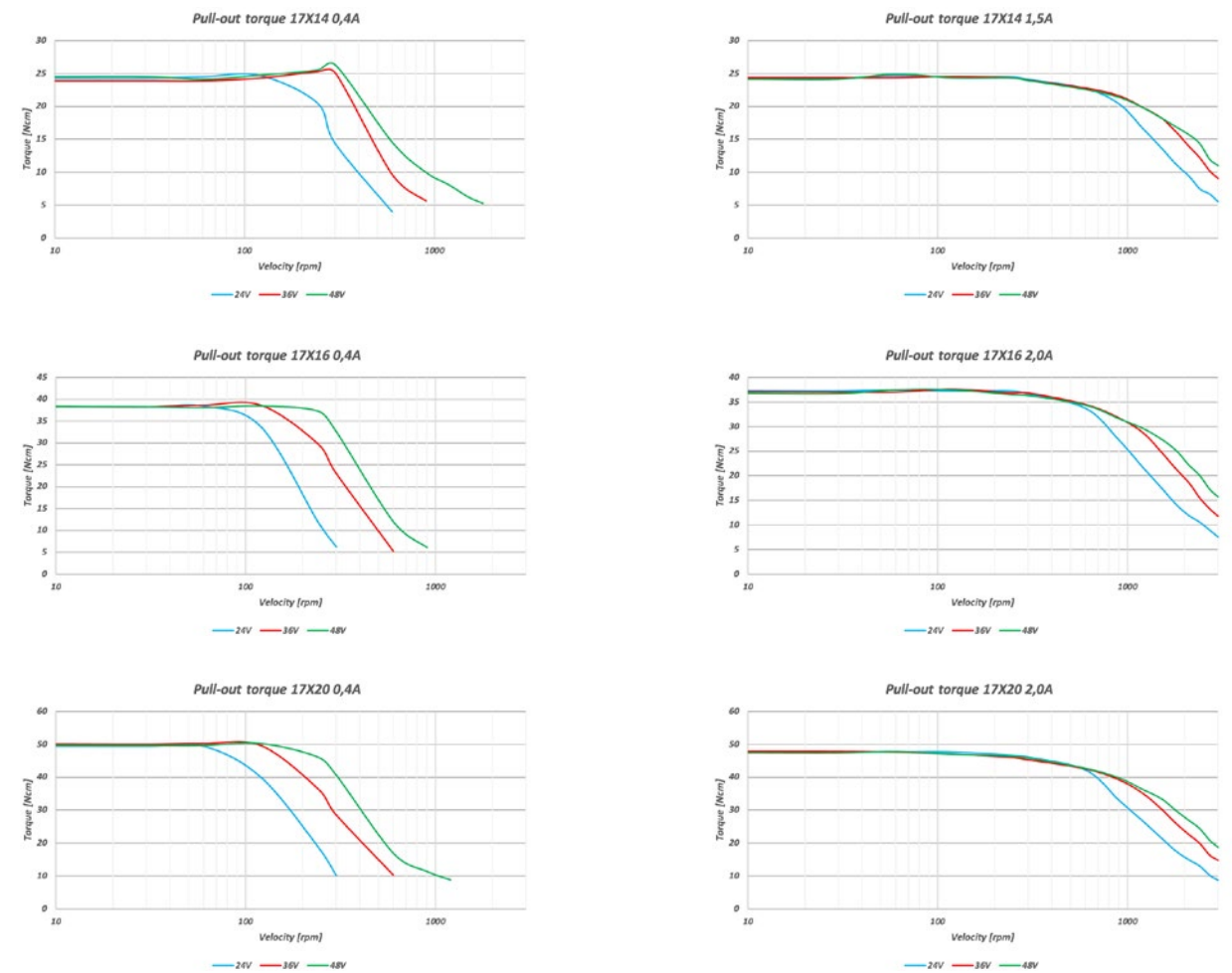
Data		ST 17x14			ST 17x16			ST 17x20			ST 17x24		
Rated phase current	A	0.40	1.00	1.50	0.40	1.00	2.00	0.40	1.00	2.00	0.40	1.00	2.00
Phase resistance	Ohm	16.340	3.450	1.390	20.070	3.360	0.860	24.880	3.870	1.090	28.500	4.600	1.240
Phase inductance	mH	21.80	4.82	1.60	37.18	6.35	1.49	43.80	7.05	1.64	62.2	10.8	2.52
Holding torque bipolar	Ncm	27.00	29.00	28.00	42.00	44.00	42.00	57.00	57.00	57.00	76.00	79.00	75.00
Detent torque	Ncm	1.40	1.40	1.40	2.00	2.00	2.00	2.50	2.50	2.50	3.00	3.00	3.00
Rotor inertia	gcm <sup>2</sup>	39.50	39.50	39.50	57.00	57.00	57.00	83.40	83.40	83.40	114.00	114.00	114.00
Max. voltage	VDC	50	50	50	50	50	50	50	50	50	50	50	50
Weight	Kg	0.385	0.385	0.385	0.445	0.445	0.445	0.545	0.545	0.545	0.595	0.595	0.595

All data measured with standard cables 300 mm at 25°C

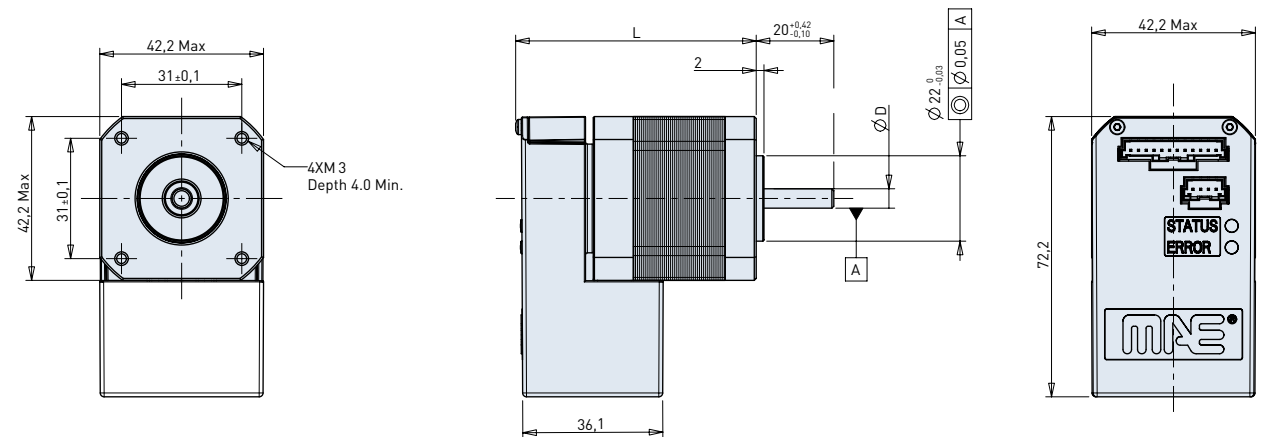
Modular System



Characteristic diagram

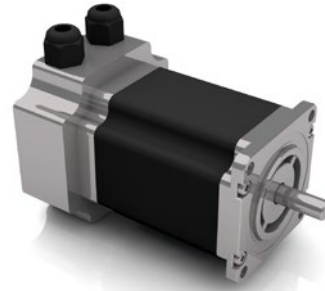


Dimensions in mm/ ST 17 CO/MB



Motor	L	D ø
17x14	56.5±0.6	5
17x16	62±0.6	5
17x20	73±0.6	5
17x24	82±0.6	5

- » 2 phase Stepper Motor 1.8° step angle with integrated controller
- » 12-bit absolute magnetic encoder (single turn)
- » CANopen interface CiA 301 and CiA 402
- » Options available: EtherCAT version, Modbus RTU on RS485 version
- » Configurable resolution microstep/rev (400 to 204 800), Max. velocity 300 000 microstep/sec
- » Step accumulation with recovery (no step-loss)
- » 32 programmable cycles and 10 programmable sequences including jog (velocity), indexer (position), homing, marker (rotating table)
- » Linear, parabolic and s-curve profiles
- » Commissioning software
- » Configurable digital and analogue I/Os



IO mode

CANopen version available

RS485 version available

Speed mode

Current mode

Positioning

Service interface

Digital inputs configurable

Digital outputs

EtherCAT version available

Oscilloscope software available

Condition monitoring

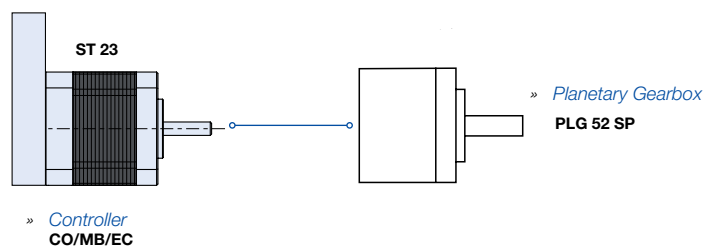
Supply voltage versions

Protection class (up to)

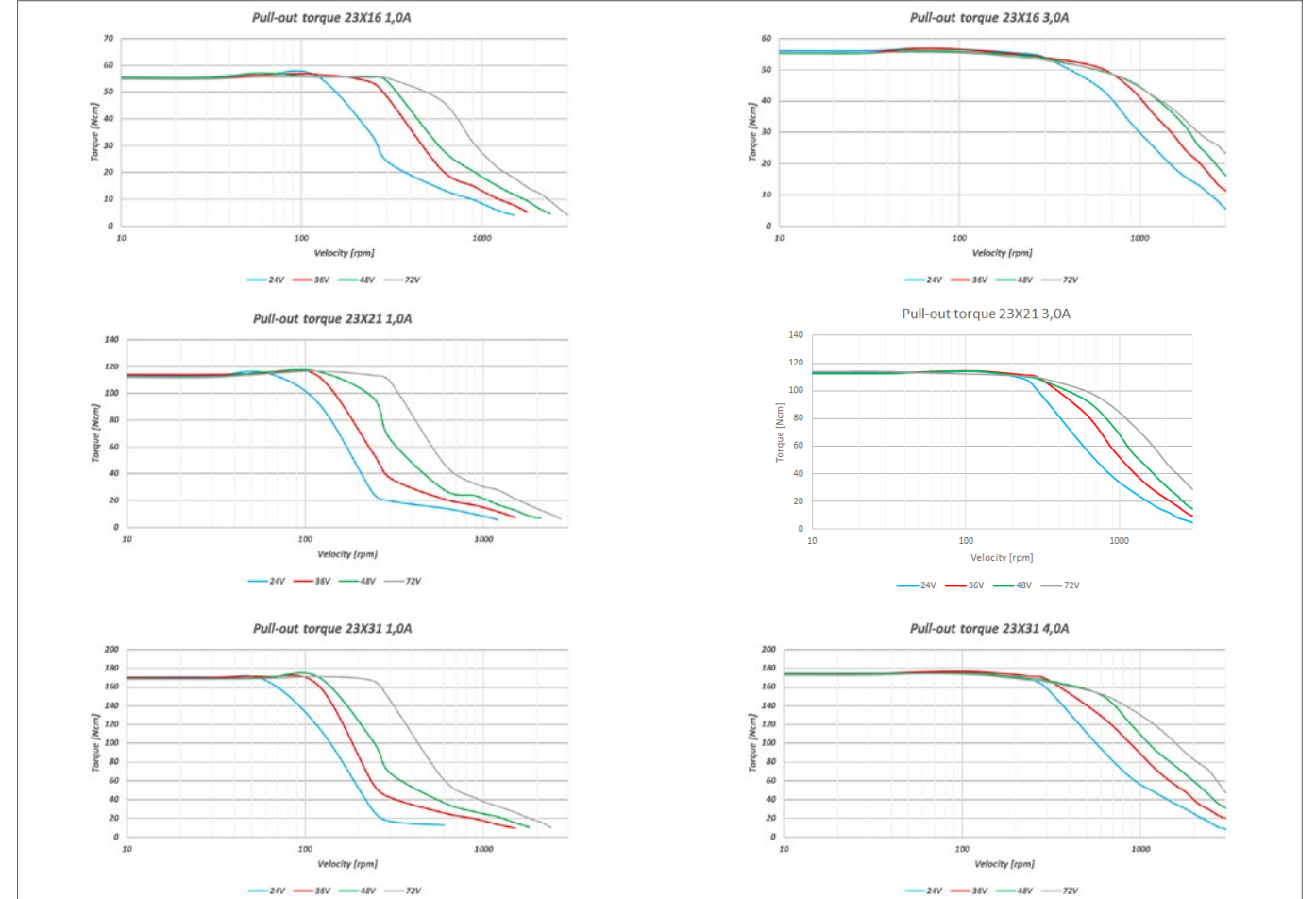
Data		ST 23x16			ST 23x21			ST 23x31			
Rated phase current	A	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	4.00
Phase resistance	Ohm	3.670	0.980	0.420	5.140	1.330	0.610	6.260	1.570	0.690	0.430
Phase inductance	mH	13.51	3.21	1.58	20.75	5.67	2.30	22.35	5.77	2.70	1.66
Holding torque Bipolar	Ncm	70.00	70.00	70.00	140.00	140.00	140.00	200.00	200.00	200.00	210.00
Detent torque	Ncm	3.00	3.00	3.00	5.00	5.00	6.00	8.00	7.00	7.00	7.00
Rotor inertia	gcm <sup>2</sup>	77.00	77.00	77.00	209.00	209.00	209.00	335.00	335.00	335.00	335.00
Max. voltage	VDC	75	75	75	75	75	75	75	75	75	75
Weight	Kg	0.655	0.655	0.655	0.895	0.895	0.895	1.245	1.245	1.245	1.245

All data measured with standard cables 300 mm at 25°C

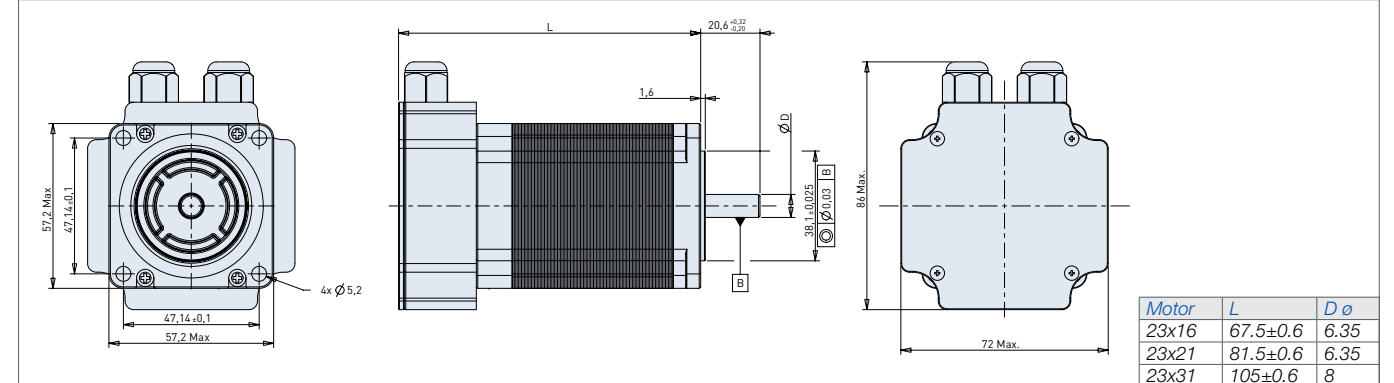
Modular System



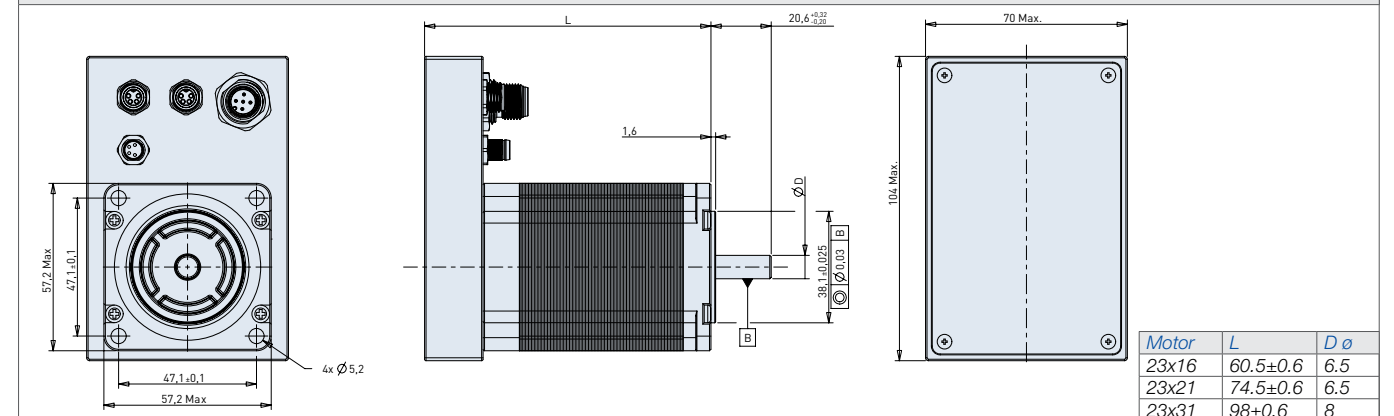
Characteristic diagram



Dimensions in mm/ ST 23 CO/MB

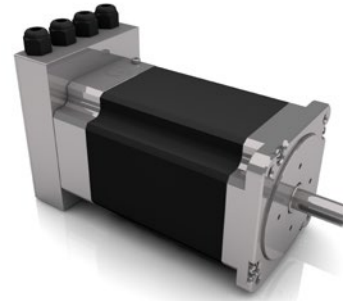


Dimensions in mm/ ST 23 EC





- » 2 phase Stepper Motor 1.8° step angle with integrated controller
- » 12-bit absolute magnetic encoder (single turn)
- » CANopen interface CiA 301 and CiA 402
- » Options available: EtherCAT version, Modbus RTU on RS485 version
- » Configurable resolution microstep/rev (400 to 204 800), Max. velocity 300 000 microstep/sec
- » Step accumulation with recovery (no step loss)
- » 32 programmable cycles and 10 programmable sequences including jog (velocity), indexer (position), homing, marker (rotating table)
- » Linear, parabolic and s-curve profiles
- » Commissioning software
- » Configurable digital and analogue I/Os



IO mode

CANopen version available

EtherCAT version available

Speed mode

Current mode

Positioning

Service interface

Digital inputs configurable

Digital outputs

Analog inputs

Oscilloscope software available

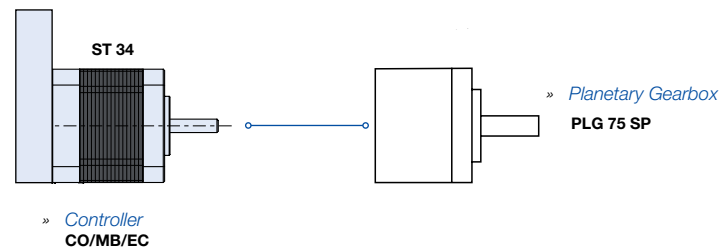
Condition monitoring

Supply voltage versions 24 - 130

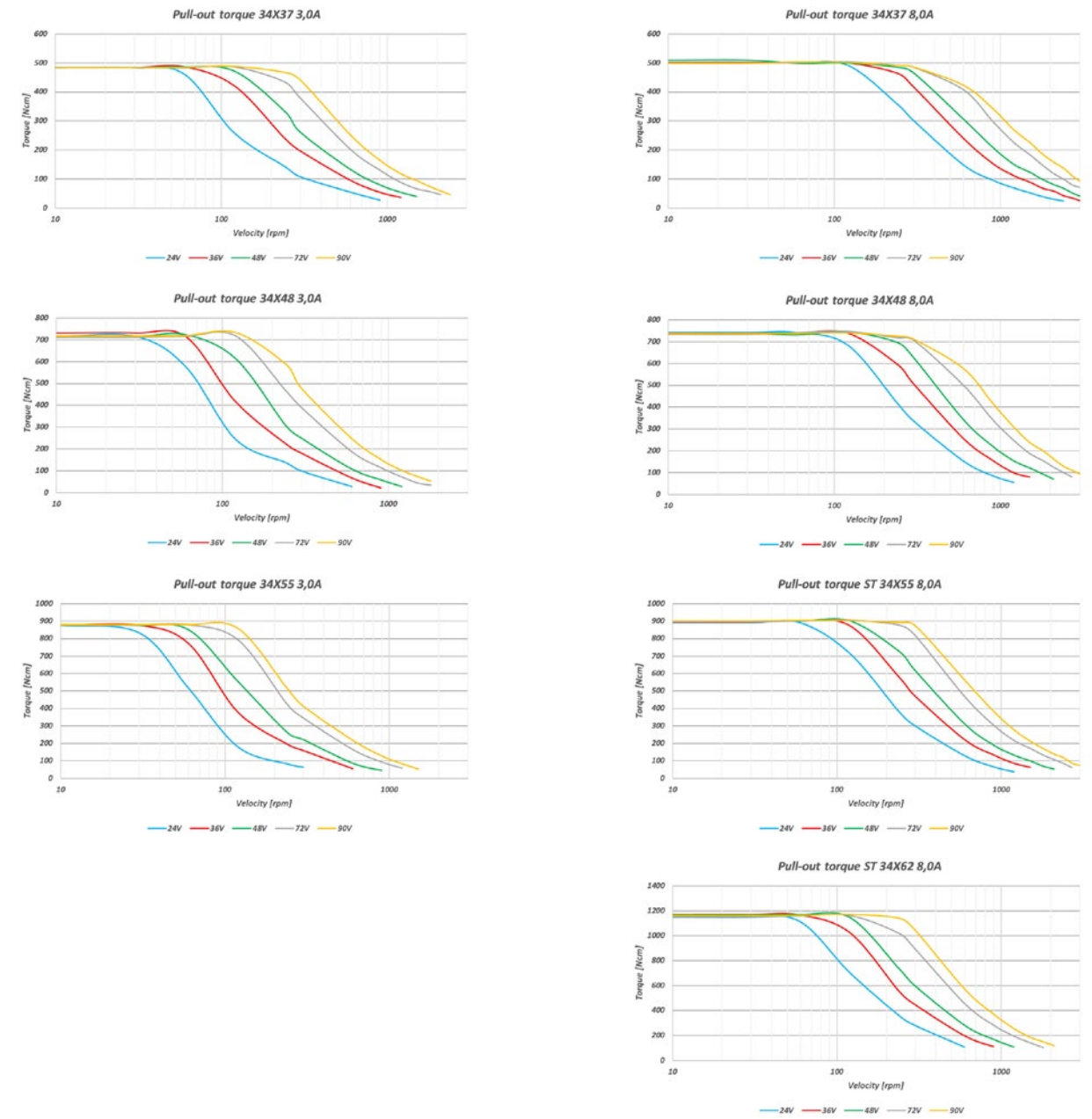
Data		ST 34x37			ST 34x48			ST 34x55			ST 34x62
Rated phase current	A	3.00	5.50	8.00	3.00	5.50	8.00	3.00	5.50	8.00	8.00
Phase resistance	Ohm	1.240	0.420	0.200	1.500	0.465	0.215	1.700	0.550	0.290	0.330
Phase inductance	mH	12.00	3.60	1.65	12.96	4.00	1.85	20.00	5.60	2.60	2.88
Holding torque Bipolar	Ncm	520.00	550.00	550.00	700.00	700.00	700.00	1000.00	1000.00	1000.00	1200.00
Detent torque	Ncm	20.00	20.00	20.00	20.00	20.00	20.00	30.00	30.00	30.00	35.00
Rotor inertia	gcm <sup>2</sup>	2860.00	2860.00	2860.00	4732.00	4732.00	4732.00	6018.00	6018.00	6018.00	7030.00
Max. voltage	VDC	160	160	160	160	160	160	160	160	160	160
Weight	Kg	3.280	3.280	3.280	4.280	4.280	4.280	4.880	4.880	4.880	5.680

All data measured with standard cables 500 mm at 25°C

### Modular System

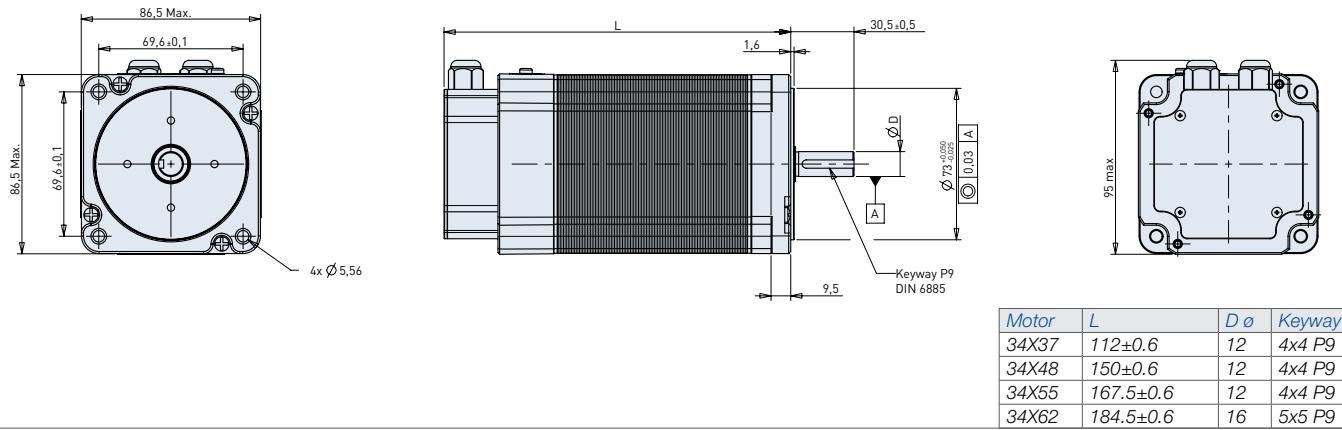


### Characteristic diagram

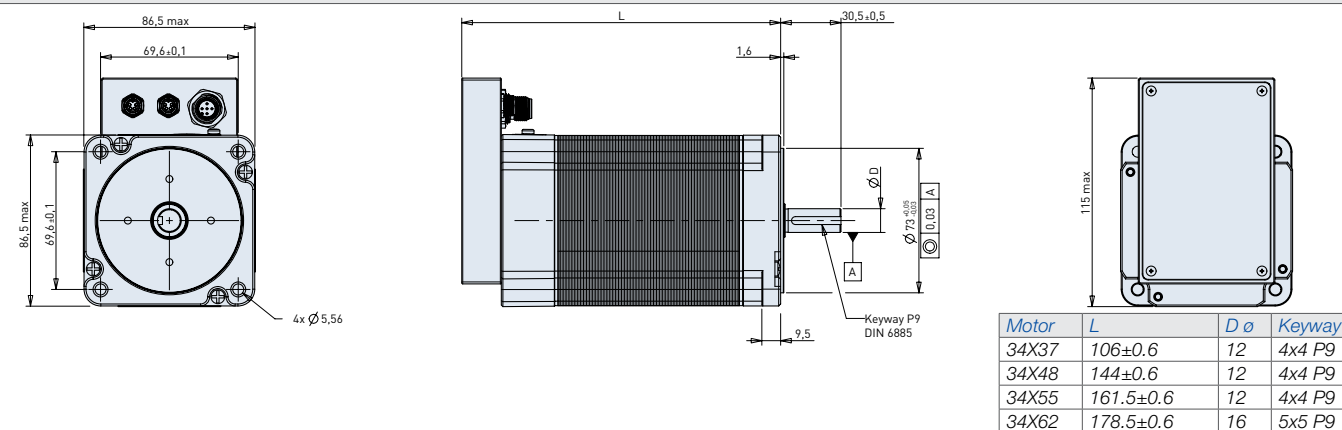




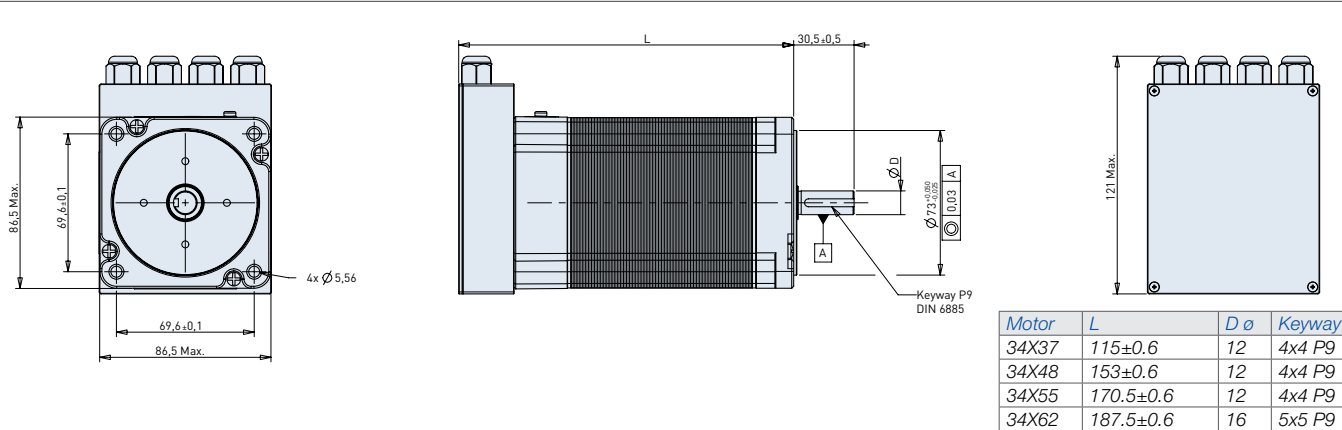
Dimensions in mm/ ST 34 CO/MB



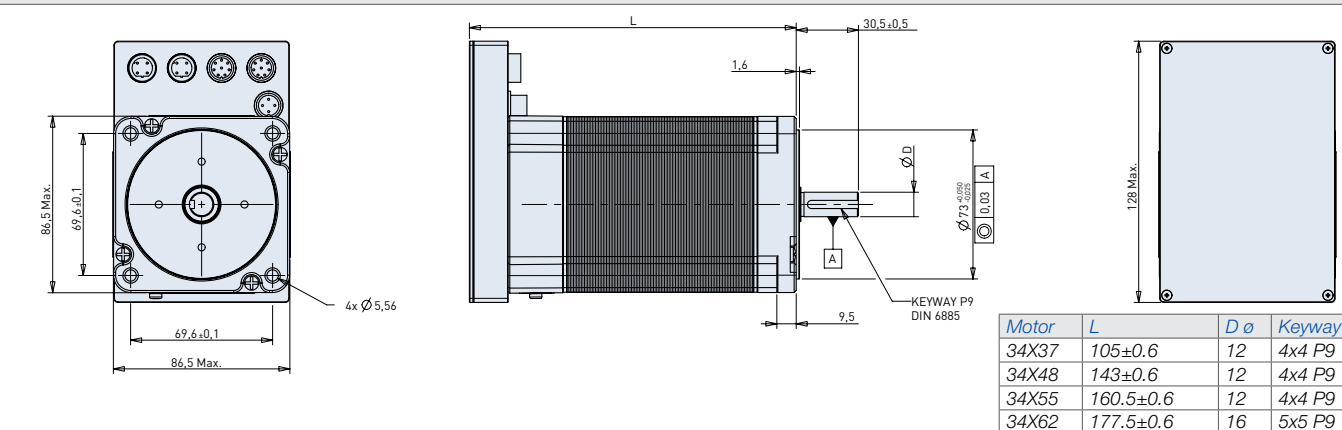
Dimensions in mm/ ST 34 EC



Dimensions in mm/ ST 34 CO/MB HighPower



Dimensions in mm/ ST 34 EC HighPower





# Brushless AC/DC Motors

» Series BL



Brushless AC/DC Motors	
Page 19	BL 42 <i>dGo</i>   Brushless Motor 42 mm
Page 76	BL 57 <i>dCore</i>   Brushless Motor 57 mm 4 Pole
Page 78	BL 57 <i>dCore</i>   Brushless Motor 57 mm 8 Pole
Page 80	BL 89 SI AC   BL 89 SI AC with integrated electronic

- » 6-Pole High Speed BLDC motor
- » Integrated controller
- » 230 VAC Plug & Play
- » Closed-Loop control
- » Sensor-less technology
- » Low cogging torque
- » Low noise level
- » External rotor

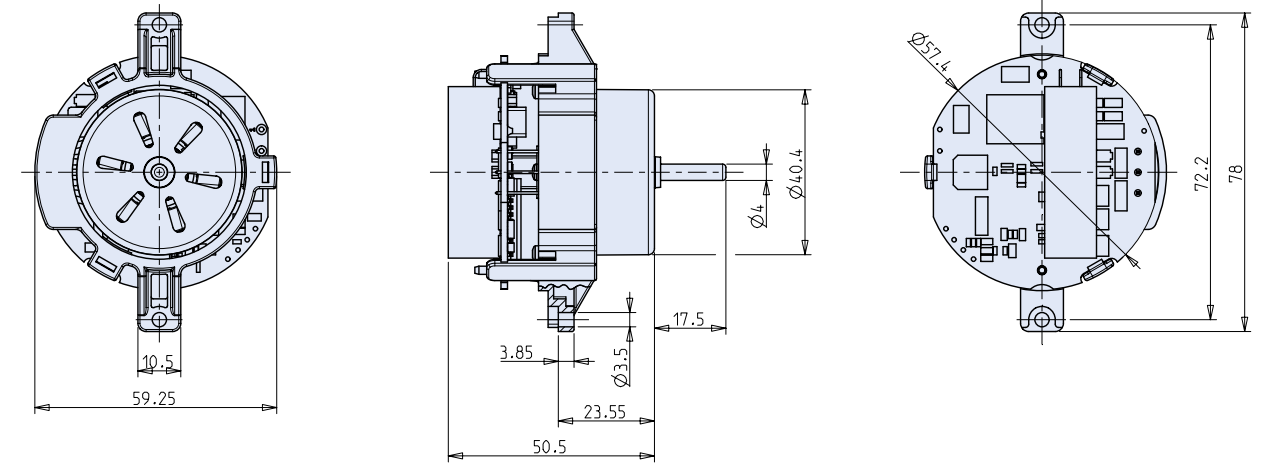


Data		BL 42x50 dGo
Nominal voltage	VAC	230 AC
Nominal current	Arms	1.3
Nominal torque	Ncm	4
Nominal velocity	rpm	28500
No load velocity	rpm	36000
Nominal input power	W	147
Nominal output power	W	119
Rotor inertia	gcm <sup>2</sup>	71.5
Weight	g	144

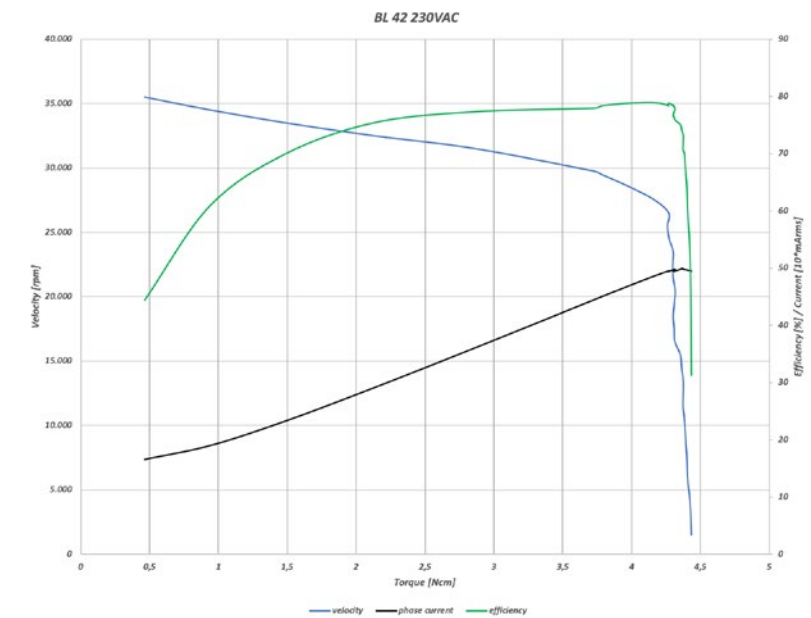
Options:

- » Pre-set fixed velocity
- » Variable speed setting [analogue or digital command signal]
- » Open loop control
- » 120VAC Supply
- » 48VDC Supply

Dimensions in mm



Characteristic diagram



- » 3 phase 4 pole BLDC motor
- » High dynamic response
- » Hall sensors for rotor position detection
- » 3 motor lengths available

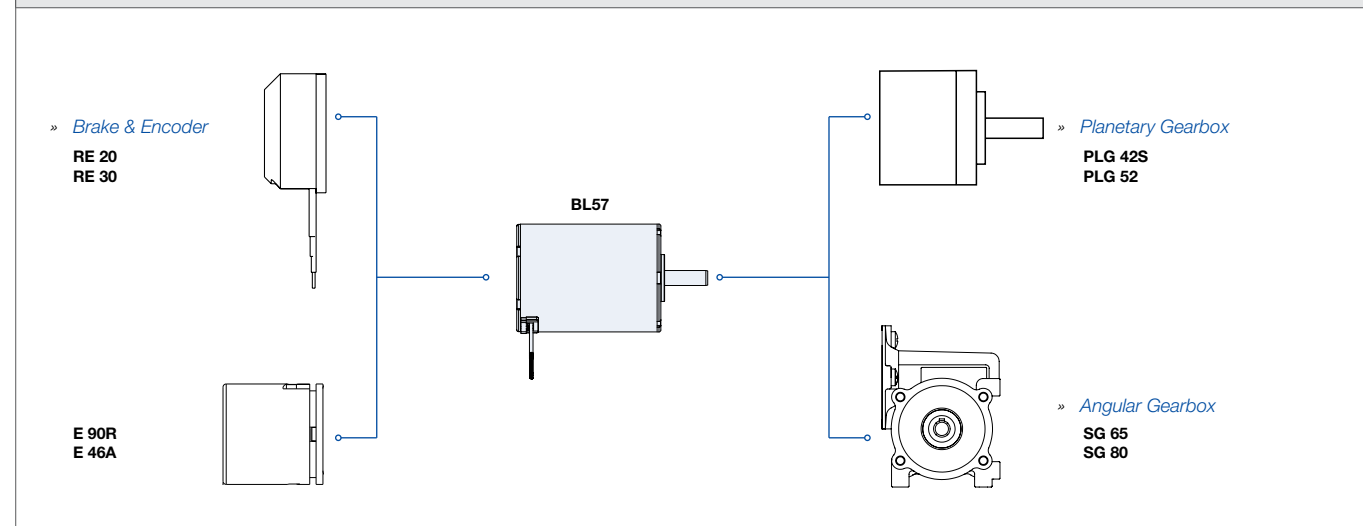
- » High power neodymium magnets
- » Low noise level
- » Low cogging torque
- » Customized solutions available on demand



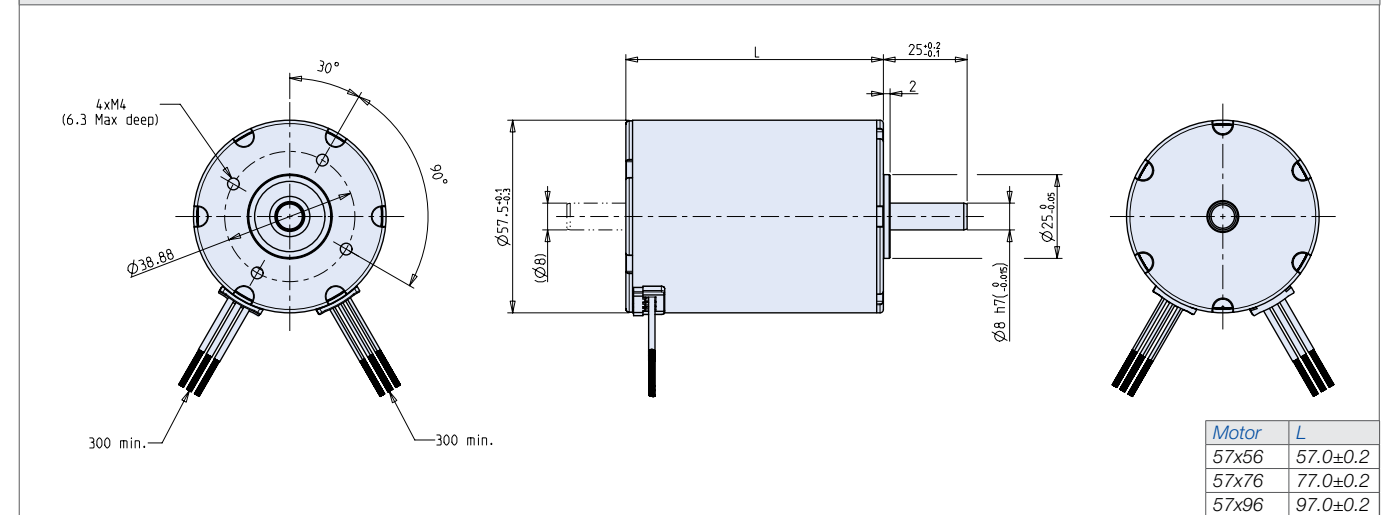
Data		BL 57x56		BL 57x76		BL 57x96	
Nominal voltage	VDC	24	40	24	40	24	40
Nominal phase current	Arms	2.73	1.73	4.76	3.43	7.31	5.20
Nominal torque	Ncm	11	11	22	25	35	35
Nominal velocity	rpm	4018	4120	3850	4150	3900	4180
Stall torque	Ncm	50	45	90	110	150	150
No load velocity	rpm	5350	5400	5320	5380	5050	5380
Nominal output power	W	46	47	89	109	143	153
Max. output power	W	65	62	139	165	201	245
Torque constant	Ncm / Arms	4.03	6.36	4.62	7.29	4.79	6.73
Phase resistance	Ohm	0.81	2.26	0.60	0.85	0.27	0.53
Phase inductance	mH	2.24	2.63	1.41	2.96	0.79	2.11
Rotor inertia	gcm <sup>2</sup>	81	81	144	144	206	206
Weight	Kg	0.60	0.60	0.90	0.90	1.15	1.15

All data measured at 25°C

Modular System



Dimensions in mm



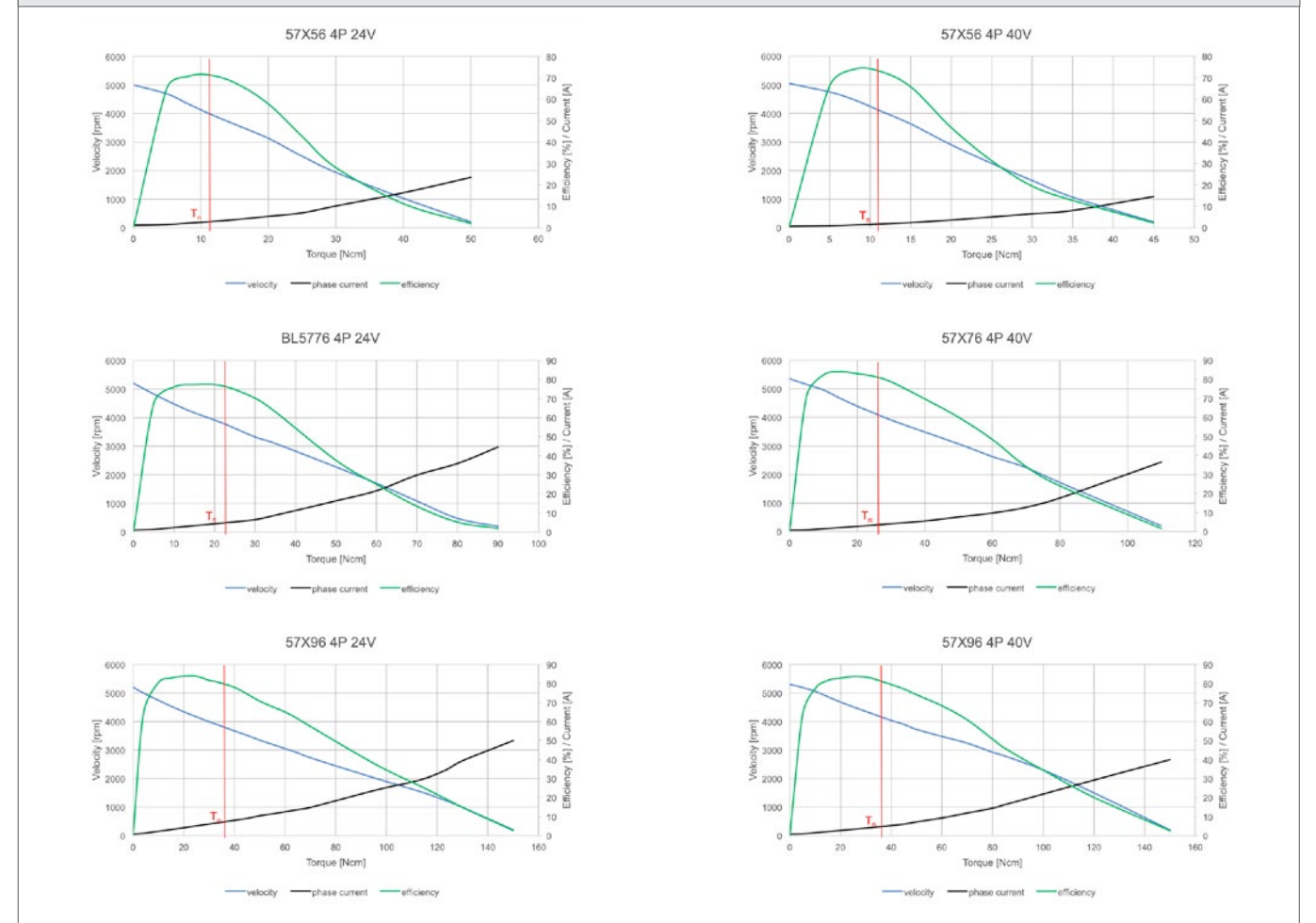
Pin Assignment

Colour	Function
Black ●	phase A
Red ●	phase B
Yellow ●	phase C

Pin Assignment

Colour	Function
Red ●	Vcc
Black ●	GND
Green ●	Hall A
Blue ●	Hall B
White ○	Hall C

Characteristic diagram



- » 3 phase 8 pole BLDC motor
- » High dynamic response
- » Hall sensors for rotor position detection
- » 3 motor lengths available

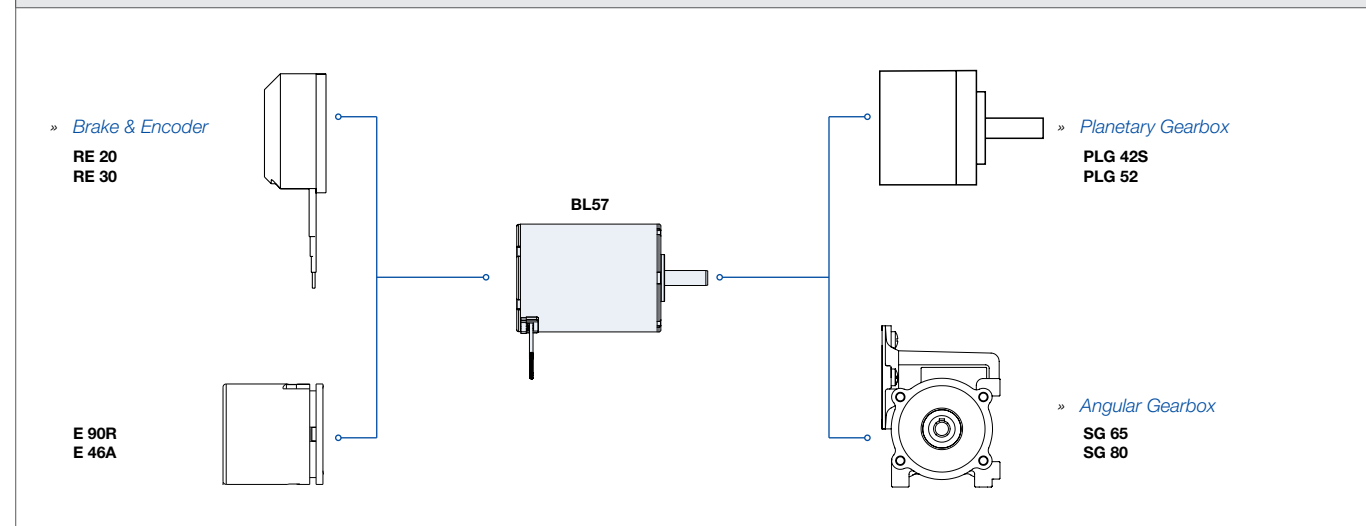
- » High power neodymium magnets
- » Low noise level
- » Low cogging torque
- » Customized solutions available on demand



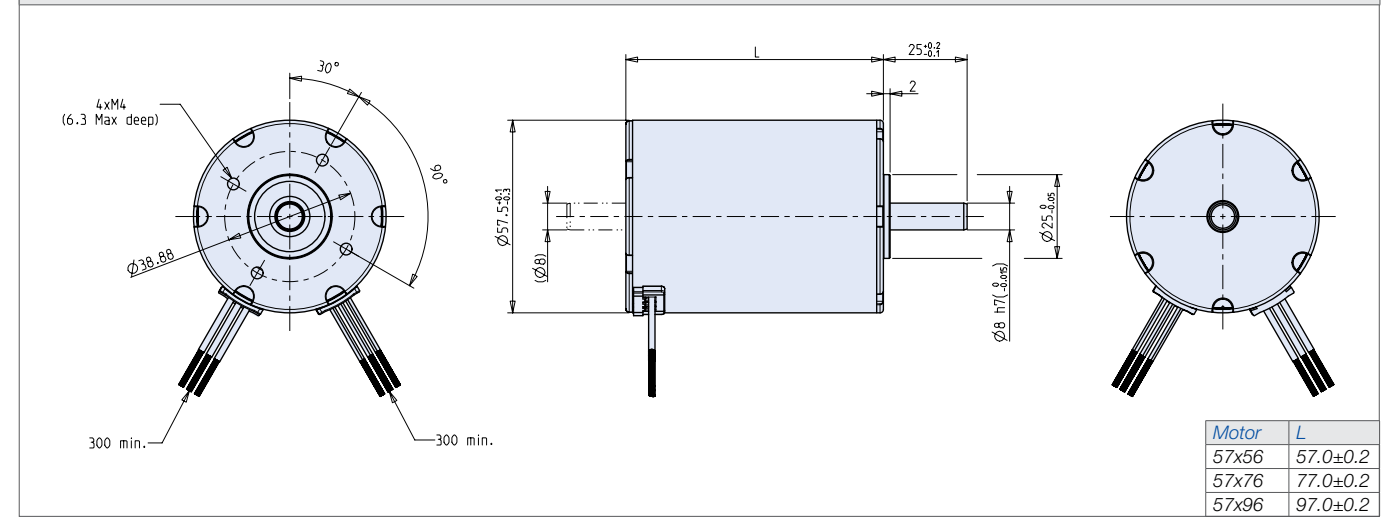
Data		BL 57x56		BL 57x76		BL 57x96	
Nominal voltage	VDC	24	40	24	40	24	40
Nominal phase current	Arms	3.15	2.32	5.13	3.06	7.20	4.68
Nominal torque	Ncm	11	11	22	22	33	33
Nominal velocity	rpm	2850	3005	3315	3324	3160	3200
Stall torque	Ncm	48	38	125	105	130	110
No load velocity	rpm	4950	4900	5050	5100	5060	5182
Nominal output power	W	33	35	76	77	109	111
Max. output power	W	45	38	118	99	159	121
Torque constant	Ncm / Arms	3.49	4.74	4.29	7.19	4.58	7.05
Phase resistance	Ohm	0.74	1.64	0.30	0.85	0.21	0.53
Phase inductance	mH	2.45	5.60	1.05	2.90	0.75	2.11
Rotor inertia	gcm <sup>2</sup>	81	81	144	144	206	206
Weight	Kg	0.60	0.60	0.90	0.90	1.15	1.15

All data measured at 25°C

Modular System



Dimensions in mm



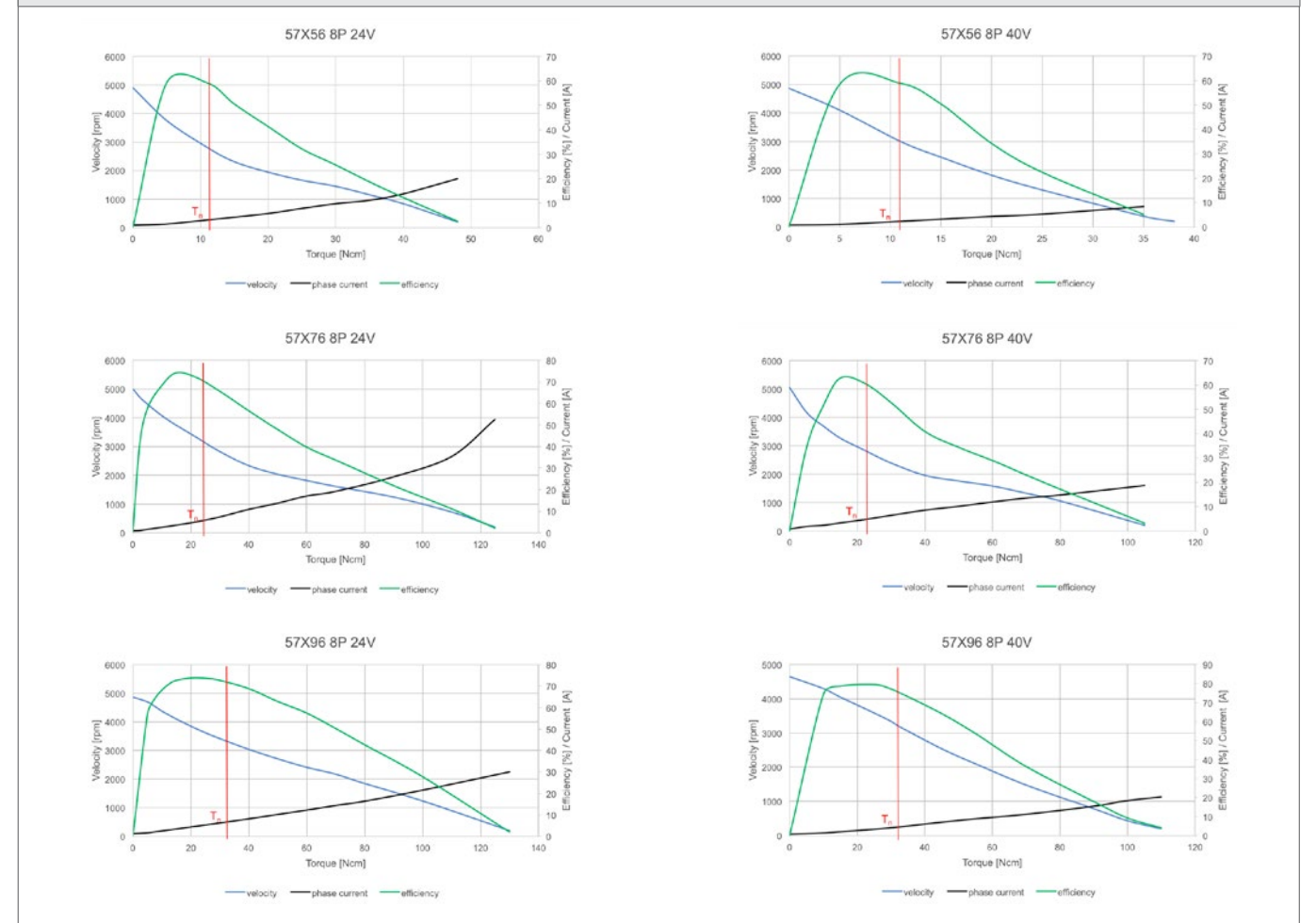
Pin Assignment

Colour	Function
Black ●	phase A
Red ●	phase B
Yellow ●	phase C

Pin Assignment

Colour	Function
Red ●	Vcc
Black ●	GND
Green ●	Hall A
Blue ●	Hall B
White ○	Hall C

Characteristic diagram





- » 110 V/ 230 V 60 Hz/ 50 Hz main voltage (DC 400 V optional)
- » Strand connections
- » Open housing according to IP20
- » Integrated electronics
- » 16,63 Ncm - 65 Ncm
- » Speed control
- » Current control (new electronics)
- » Inrush current limitation (new electronics)

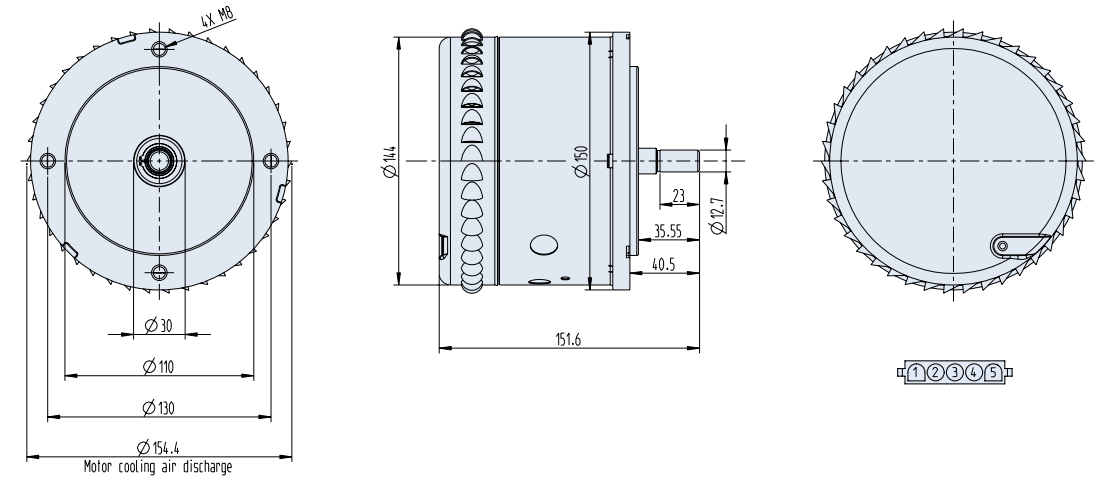
- » Electrical input:
  - » 1 differential analog input (galvanically isolated)
- » Electrical output:
  - » 1 digital output input (galvanically isolated)
  - » 10 V auxiliary voltage output (new electronics)
  - » Possibility for extension by „option card“



Data		BL 89x111
Torque	Ncm	65
Efficiency	%	57,5
Speed	rpm	3000 (up tp 12000)
Supply voltage	VAC	110/230
Frequency	Hz	60/50
Protection class	-	IP20
Certification	-	UL
Ambiente temperature	C°	0-50°C
Input power (with cooling system)	W	400 W
Weight	kg	2

All data measured with standard cables 300 mm at 25°C

Dimensions in mm



Speed Control options and Electrical Connection

**PWM: 400Hz – 20Mz +10V nominal, min 10% duty cycle**

Pin #	Function
1	Speed command PWM
2	Speed command PWM

**Current: 5mA – 20mA +10V nominal**

Pin #	Function
1	Speed command current
2	Speed command current

**On/Off: Without Electrical Speed Control**

Pin #	Function
1	Not used
2	Not used

Molex connector (Pin # 6 & 7) not present

**Pin Assignment**

Pin #	Function	Pin #	Function
05P AMP Mate-N-Lok 350810-1		2 Pole Molex 39-01-3029	
Male Pins AMP 350873-1		Male Pins Molex PN 39000061	
1	Speed command Common	6	Signal Digital Output
2	Speed command 0-10VDC	7	Common Digital Output
3	Ground		
4	Line		
5	Neutral		



# Permanent Magnet DC Motors

» Series PM



<b>Permanent Magnet DC Motors</b>	
Page 84	PM 62   Permanent Magnet DC Motor 62 mm

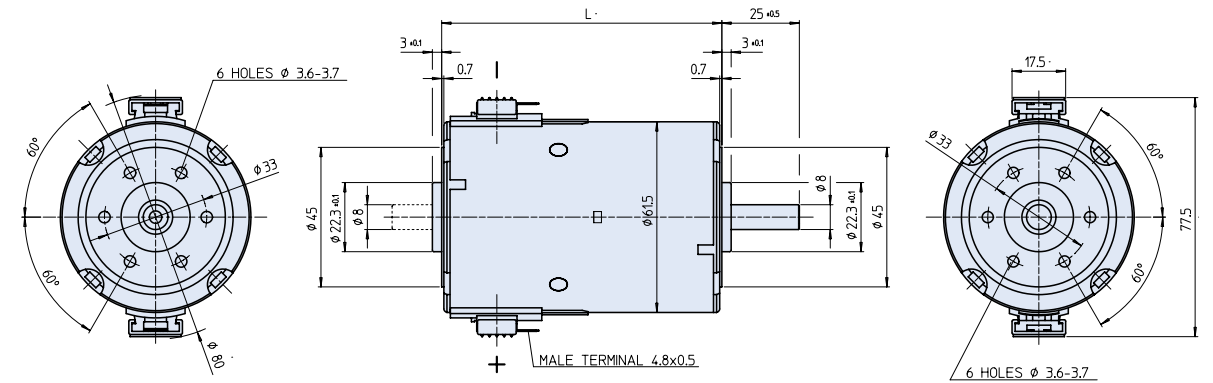
- » 2-Pole DC motor
- » Operation in both direction of rotation
- » Replaceable brush system

- » Options with custom shaft length and diameter
- » High voltage winding 120V - 230V available



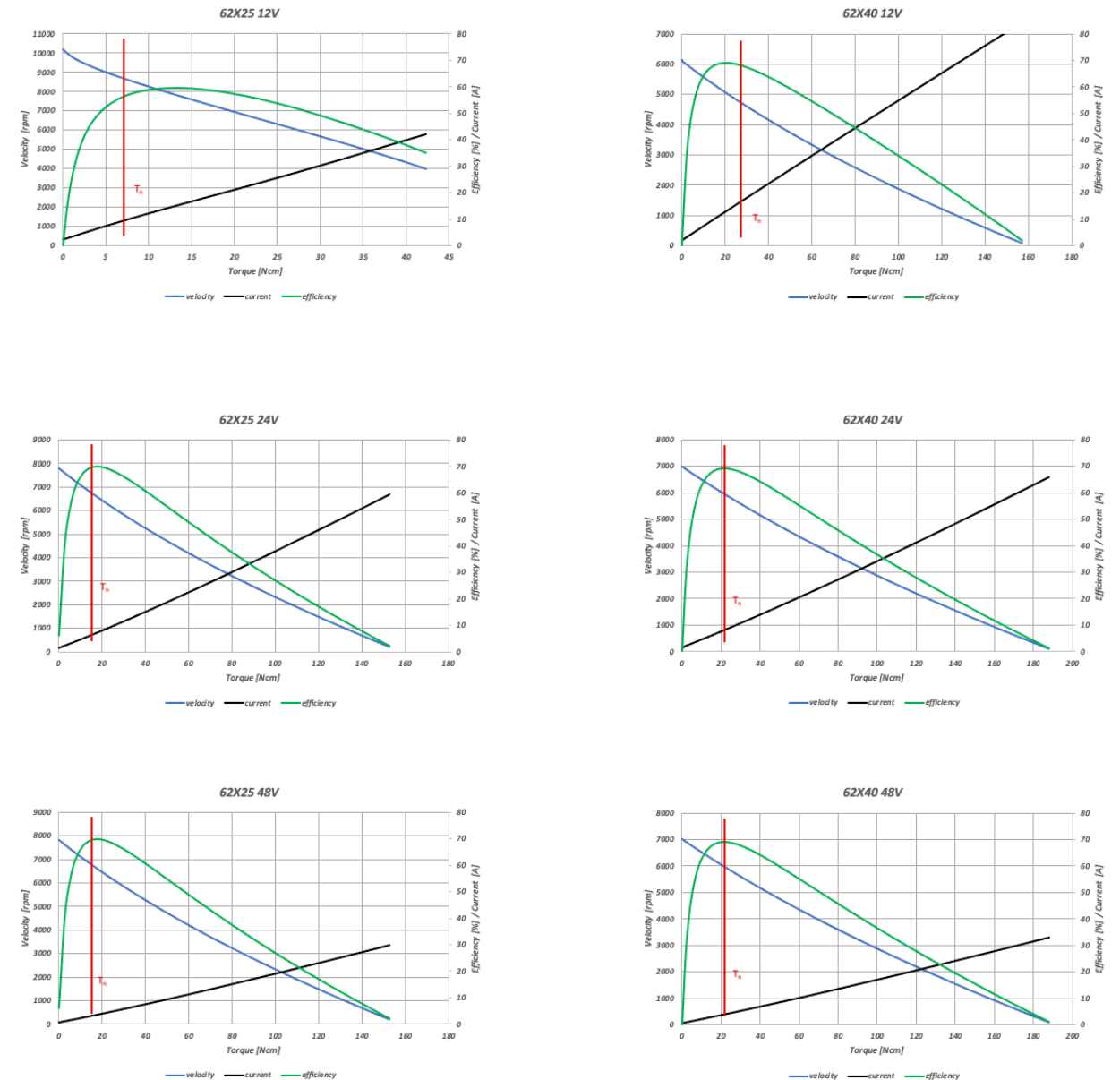
Data		PM 62x25			PM 62x40		
Nominal voltage	VDC	12	24	48	12	24	48
Nominal current	A	8.6	5.0	2.5	14.7	7.2	3.6
Nominal torque	Ncm	6.2	10.9	11.1	23.6	19.1	19.3
Nominal velocity	rpm	8830	7052	7035	4907	6076	6065
Stall torque	Ncm	70	125	155	160	190	190
No load velocity	rpm	10200	7800	7750	6150	7000	6930
Nominal output power	W	57	80	82	121	122	123
Torque constant	Ncm / A	0.72	2.19	4.39	1.60	2.65	5.30
Terminal resistance	Ohm	0.11	0.36	1.51	0.10	0.30	1.46
Rotor inertia	gcm <sup>2</sup>	320	320	320	400	400	400
Weight	Kg	0.87	0.87	0.87	1.00	1.00	1.00

Dimensions in mm



Motor	L
62X25	90.4±0.5
62X40	105.4±0.5

Characteristic diagram





# Accessories

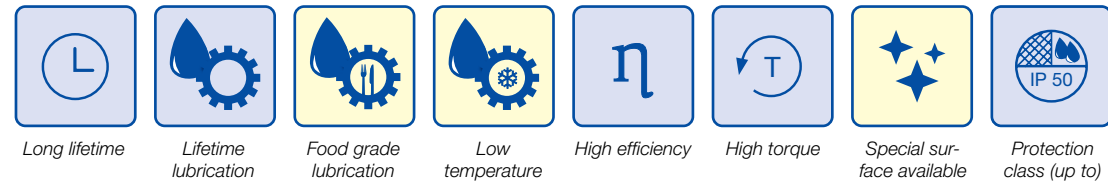
- » Gearboxes
- » Incremental Encoders
- » Brakes
- » Accessories



<b>Gearboxes, Encoders, Brakes, Controllers, Accessories</b>	
Page 88	Gearboxes
Page 96	Incremental Encoders
Page 97	Brakes
Page 98	Accessories

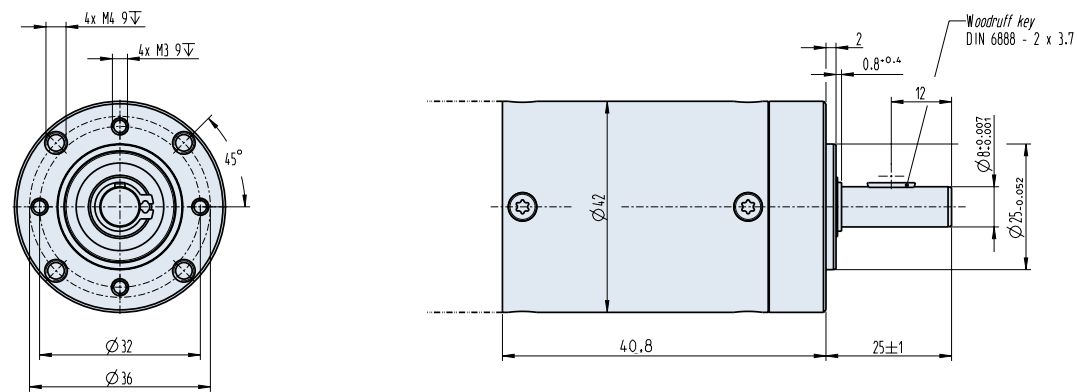
## >> PLG 42 SP | Planetary Gearbox

- » Long lifetime
- » Compact, industry compatible planetary gearbox
- » Output shaft with dual ball bearings
- » All stages have straight toothing
- » Optimized for stepper operation



Data   PLG 42 SP - Ring gear made of steel				
Reduction ratio	-	4.00	6.25	8.00
Efficiency	%	90		
Number of stages	-	1		
Continuous torque	Nm	4.5	5.5	6
Acceleration torque	Nm	4.7	6	7.5
Emergency stop torque	Nm	5	6.5	8.5
Operating mode	-	S1 / S8		
Weight of gearbox	kg	0.2	0.2	0.2
Axial load / radial load (middle of key)	N	150 / 250		

### Dimensions in mm

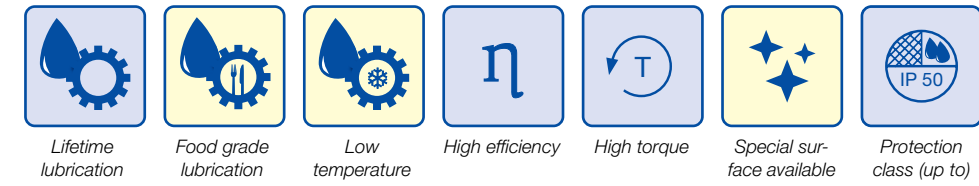


Depending on the motor type, the mounting pattern may be rotated by 45°. Please ask us for details

■ Preferred series ■ Standard product - MOQ may apply ■ On request

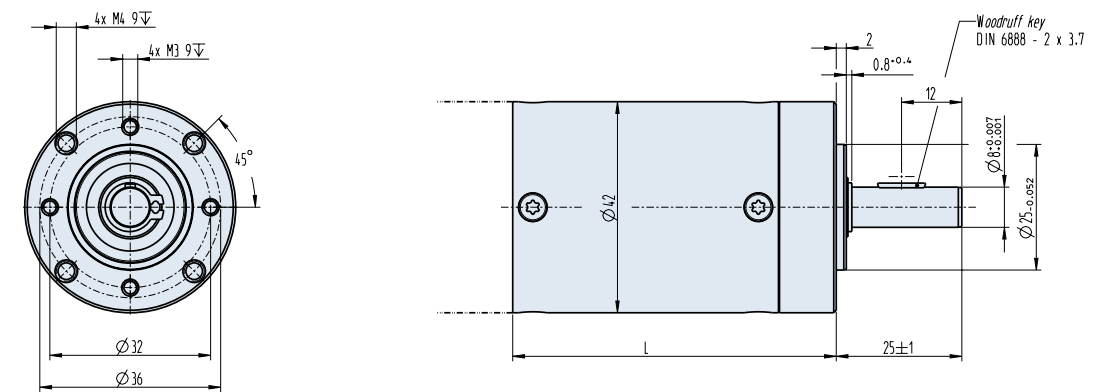
## >> PLG 42 S | Planetary Gearbox

- » Compact, industry compatible planetary gearbox
- » Output shaft with dual ball bearings
- » All stages have straight toothing



Data   PLG 42 S - Ring gear made of steel																	
Reduction ratio	-	4	6.25	8	16	25	32	50	64	100	128	156.25	200	256	312.5	400	512
Efficiency	%	90			81			73									
Number of stages	-	1			2			3									
Continuous torque	Nm	up to 0.7 (no metallic planet gears) / 3.5			up to 6			up to 14									
Weight of gearbox	kg	0.27			0.37			0.47									
Axial load / radial load (middle of key)	N	150 / 250			150 / 250			150 / 250									

### Dimensions in mm



Depending on the motor type, the mounting pattern may be rotated by 45°. Please ask us for details

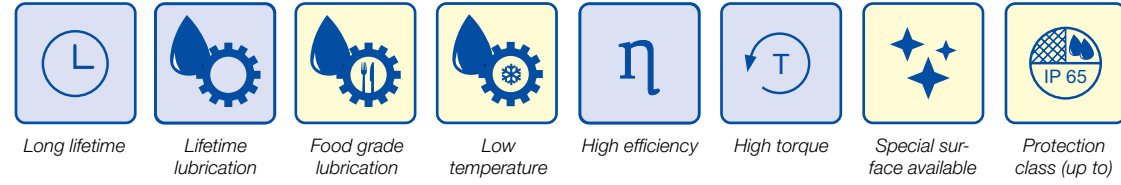
Length L mm	
1 stage	46.8
2 stage	58.6
3 stage	70.4

■ Preferred series ■ Standard product - MOQ may apply ■ On request



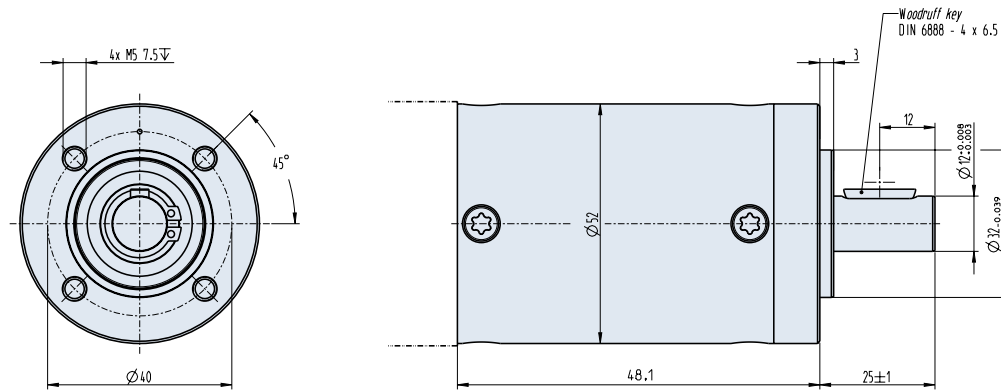
## >> PLG 52 SP | Planetary Gearbox

- » Long lifetime
- » High efficiency
- » Output shaft with double ball bearings
- » All stages have straight toothing
- » Optimized for stepper operation



Data   PLG 52 SP - Ring gear made of steel				
Reduction ratio	-	4.00	6.25	8.00
Efficiency	%	90		
Number of stages	-	1		
Continuous torque	Nm	8.0	8.0	8.0
Acceleration torque	Nm	4.7	6	7.5
Emergency stop torque	Nm	8.5	10	14
Operating mode	-	S1 / S8		
Weight of gearbox	kg	0.6	0.6	0.6
Axial load / radial load (middle of key)	N	300 / 500		

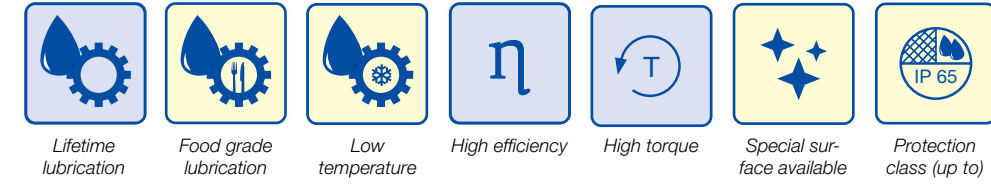
### Dimensions in mm



## >> PLG 52 | Planetary Gearbox



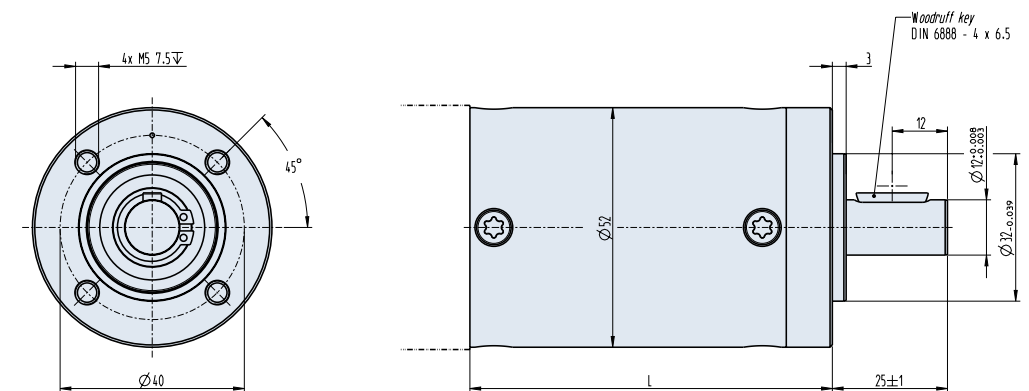
- » High efficiency
- » Output shaft with double ball bearings
- » All stages have straight toothing
- » Reinforced version on demand



Data   PLG 52 - Ring gear steel or plastic																	
Reduction ratio	-	4.5	6.25	8	15	20.25	28.12	36	50	64	91.12	126.5	162	225	288	400	512
Efficiency	%	90			81			73									
Number of stages	-	1			2			3									
Continuous torque	Nm	up to 1.2			up to 8			up to 24									
Weight of gearbox	kg	0.56			0.72			0.88									
Axial load / radial load (middle of key)	N	500 / 350			500 / 350			500 / 350									

### Dimensions in mm

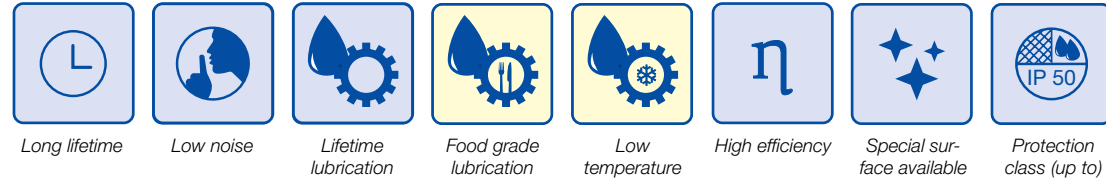
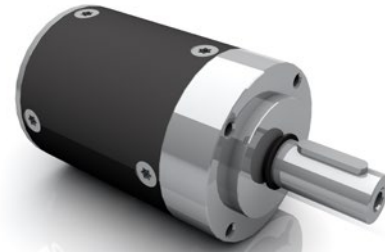
Depending on the motor type, the mounting pattern may be rotated by 45°. Please ask us for details.



Length L mm	
1 stage	50
2 stage	65.5
3 stage	80.5

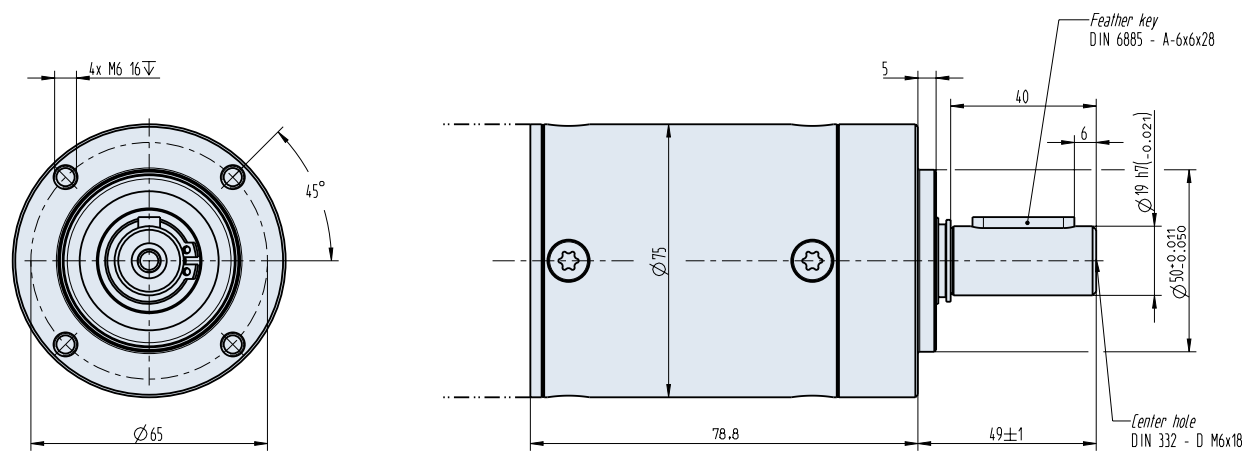
## >> PLG 75 SP | Planetary Gearbox

- » Industry compatible planetary gearbox
- » High efficiency
- » All stages have straight tothing
- » Output shaft with double ball bearings
- » Optimized for stepper operation



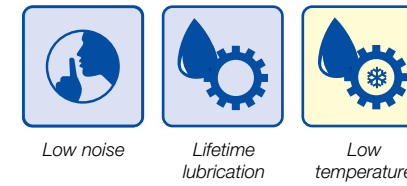
Data   PLG 75 SP - Ring gear made of steel				
Reduction ratio	-	4.20	5.00	7.00
Efficiency	%		90	
Number of stages	-		1	
Continuous torque	Nm	44	52	50
Acceleration torque	Nm	47	56	7.5
Emergency stop torque	Nm	8.5	10	65
Operating mode	-		S1 / S8	
Weight of gearbox	kg	1.7	1.7	1.7
Axial load / radial load (middle of key)	N		1000 / 1000	

### Dimensions in mm



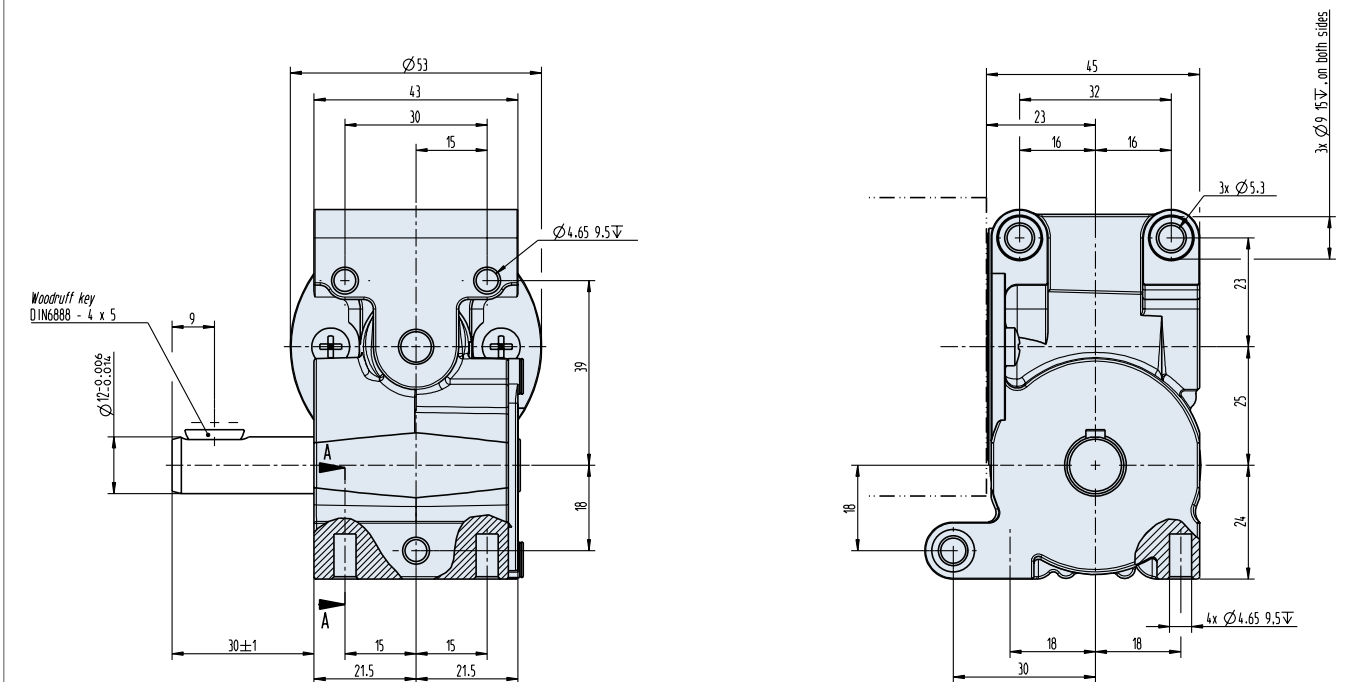
## >> SG 65 | Right-Angle Gearbox

- » Housing made of high-tensile zinc die-cast
- » Compact design, ideal for door applications
- » Worm wheel made of specific, high grade material for quiet operation
- » Standard output shaft with dual ball bearings, shaft output to the left
- » Shaft output to the right or double output shaft also available
- » Combined with brushless (series BL 57)
- » Customisation by adding pulleys



Data   SG 65			
Reduction ratio			10.25
Efficiency	%		0.8
Continuous torque	Nm		4
Peak torque	Nm		7
Axial load / radial load	N		200 / 250

### Dimensions in mm



- » Housing made of high-tensile die-cast
- » Worm wheel made of brass
- » Output shaft with ball bearings on both sides, shaft output to the left
- » Shaft output to the right or double shaft output on demand

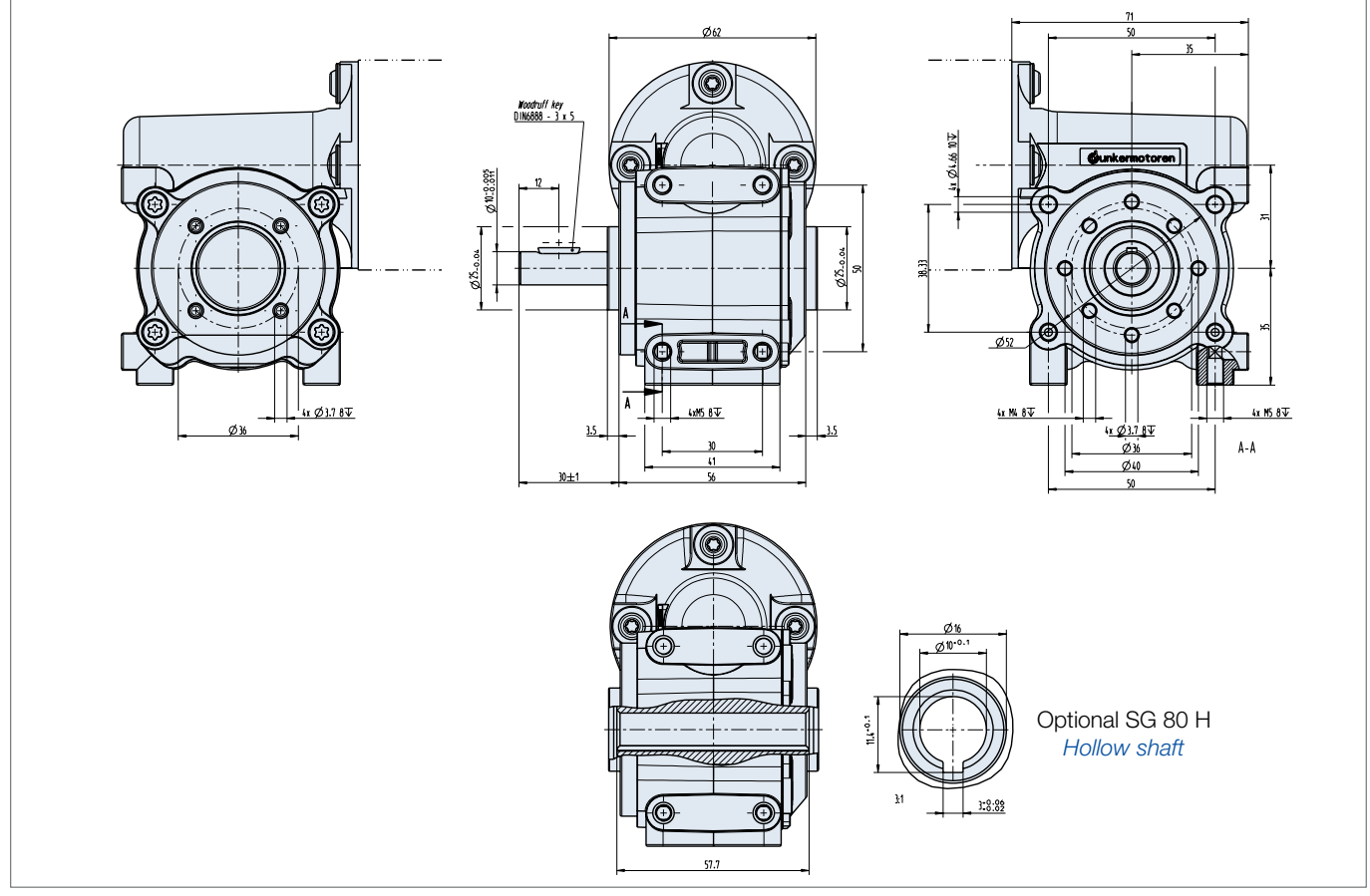


Low noise	Lifetime lubrication	Low temperature	Self-locking ratios available	Protection class (up to) IP 54

Data   SG 80   SG 80 H   SG 80 K								
Reduction ratio	SG 80 / SG 80 H	5	10	15	24	38	50	75
Efficiency	%	70	65	55	50	40	35	25
Continuous torque	Nm	2	2.5	3.5	3.5	3.5	4	4
Max. acceleration torque	Nm	8						
Emergency torque	Nm	12						
Operating mode	-	S1 / S8 *						
Reduction ratio	SG 80 K	7	10	15	24.5	-	-	-
Efficiency	%	82	80	70	65	-	-	-
Continuous torque	Nm	2.5	2.5	3.5	3.5	-	-	-
Max. acceleration torque	Nm	5	5	7	7			
Emergency torque	Nm	12						
Operating mode	-	S8 *						
Weight of gearbox	kg	0.9						
Axial load / radial load	N	300 / 350						

\* S8 = Duty cycle 60% on, acceleration torque for 1% of the cycle, input speed 3000 rpm, S1 = Continuous operation in one direction, input speed 3000 rpm

Dimensions in mm



The incremental encoders operate contact-free with no wear. For cable lengths of more than 2.5 m between encoder and control, the use of an encoder with driver (TI) is recommended. The standard supply voltage of the incremental encoders is 5 VDC. 24V versions are also available in special versions. The encoders can either be mounted open to the motors or with protective hoods in protection class IP54 or higher.



Data		RE 20	RE 30	RE 30	RE 30 TI	RE 30 TI	RE 30 TI
Nominal voltage	VDC	5	5	5	5	24	5
Signals per rotation	ppr	100	500	500	500	500	1024
Interface	-	A/B	A/B	A/B/I	A/B/I	A/B/I	A/B
Rise time	ns	15	200	180	20	2000	20
Fall time	ns <sup>1</sup>	15	50	49	20	2000	20
Input current	mA	25	40	85	165	100	120
Output voltage (low-Max.)	VDC	0.6	0.4	0.4	0.5	1.2	0.5
Output voltage (high-min.)	VDC	2.4	2.4	2.4	2.5	22	2.5
Output current Max.	mA	20	5	5	20	30	20
Operating temperature	°C	-20...+85	-40...+100	-40...+100	0...+70	-25...+85	0...+70
Protection class	IP	30	30	30	30	30	30

RE 30 (without cover) IP 30

Suitable connector with 500 mm strand

Pin	RE 30
1	GND 0V
2	(I)
3	A
4	Vcc 5V
5	B

RE 30 TI (without cover) IP 30

Suitable connector with 500 mm strand

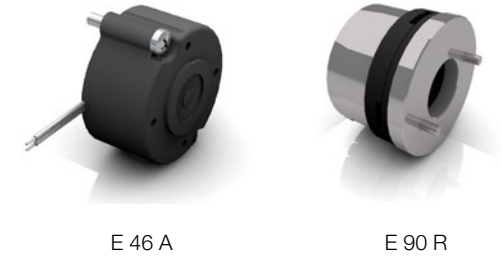
Pin	RE 30		
1	n.c.	6	A
2	Vcc 5V	7	/ B
3	GND 0V	8	B
4	n.c.	9	(/I)
5	/A	10	(I)

RE 20 (without cover) IP 30

Pin	RE 20
1	GND 0V
2	-
3	A
4	Vcc 5V
5	B

» Available on request

The brakes are designed as static brakes, but have emergency stop characteristics. The performance data are guideline values that can deviate in individual cases. When selecting the brakes, carefully check and coordinate installation situations, braking torque fluctuations, friction work, running-in behaviour and wear as well as ambient conditions. In the event of temperature fluctuations, the torque can drop sharply, e.g. due to condensation. During prolonged standstill, the friction linings can stick to the friction surfaces. The user must take appropriate counter-measures.



Data		E 46 A	E 90 R	E 310 R
Nominal voltage	VDC	24	24	24
Nominal torque*	Nm	0.3	1	3.3
Nominal current*	mA	260	310	530
Nominal input power*	W	6.3	7.5	12.7
Activation time	ms	8	30	20
Deactivation time	ms	5	30	65
Protection class	IP	20	20	20
Weight	kg	0.1	0.45	0.5

\* Values valid in run-in condition

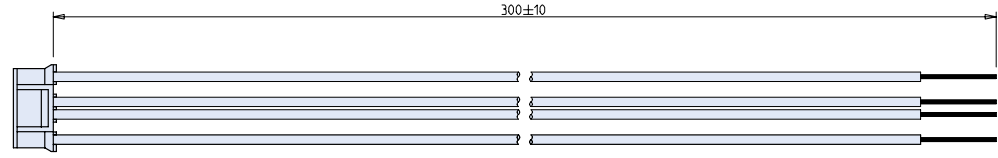
Brakes IP 20

Length (L in mm)		
	E 46	E 90
Ø	46	59
L	25.5	42.3
Strand colour	grey	grey
Strand colour	grey	grey
Strand length	500	300

Brakes are not in extruded body

Connector with cable for ST 17 634 017

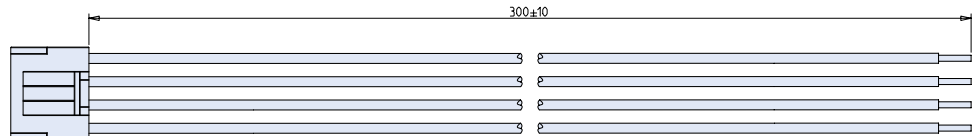
» Connector: JST PHR-6 » Terminal: JST SPH-002T-PO5L » Leads: AWG26 UL1569



Lead wires		
pin #	Colour	Function
1	White	phase A+
3	Yellow	phase A-
4	Red	phase B+
6	Blue	phase B-

Connector with cable for ST 23 634 023

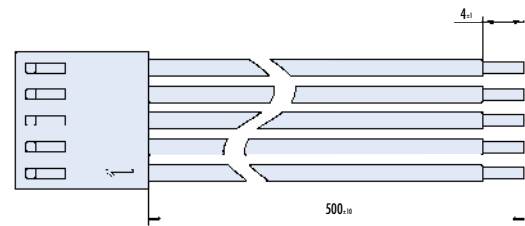
» Connector: JST VHR-4N » Terminal: JST SVH-21T-P1.1 » Leads: AWG22 UL1569



Lead wires		
pin #	Colour	Function
1	White	phase A+
2	Yellow	phase A-
3	Red	phase B+
4	Blue	phase B-

Connector with cable for encoder RE 20 / 30

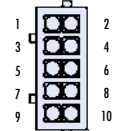
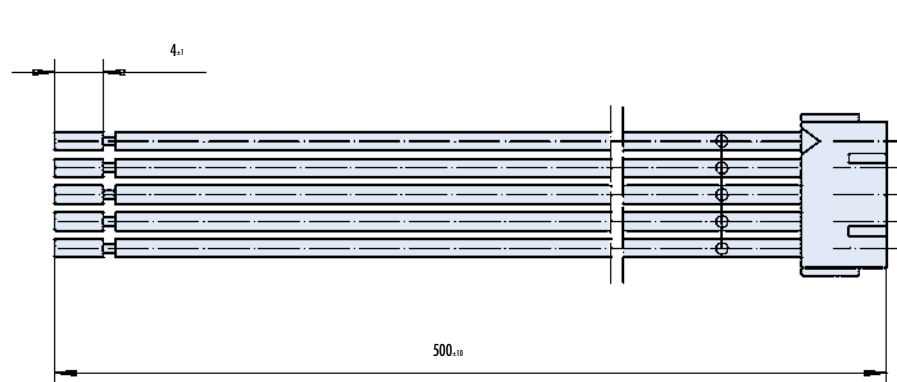
Connector: Molex, 5-pin Type 5051-M



Pin	Color
1	black
2	brown
3	yellow
4	red
5	green

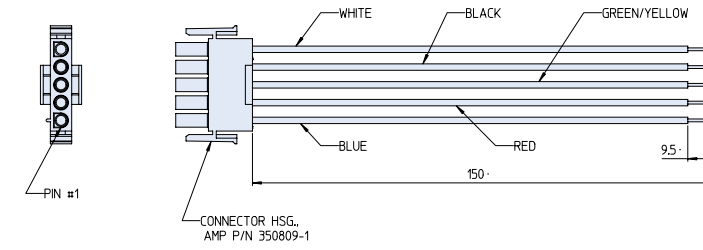
Connector with cable for encoder RE .. T1

Connector: JST, PHDR-10VS; Leads AWG 24

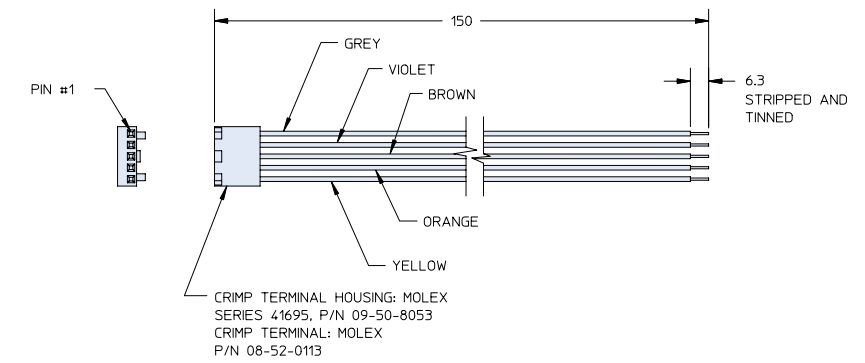


Pin	Color
1	-
2	red
3	black
4	-
5	grey
6	yellow
7	white
8	green
9	pink
10	brown

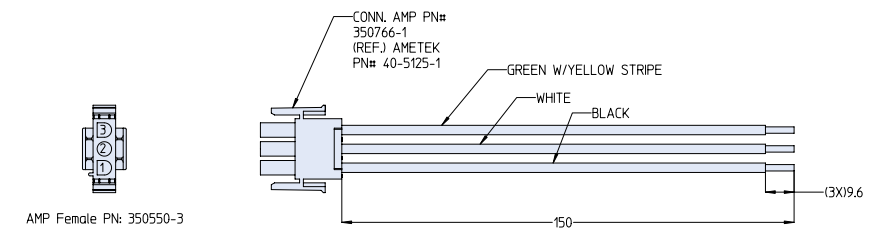
PN 5230002512 Power Harness for BB 89 145 mm 621 089 AC



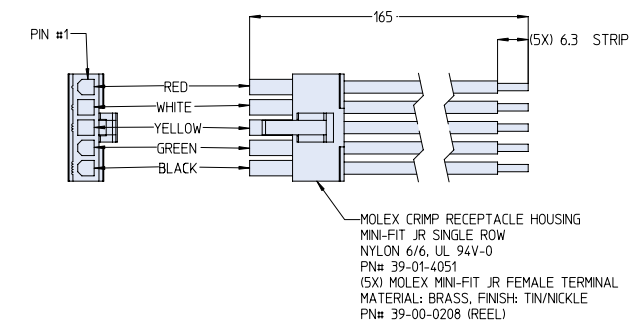
PN 5230002657 Option Card Harness for BB 89 145 mm 621 089 AC



PN 5230002658 Power Harness for BB 158 312 mm 612158 120V 1Ph

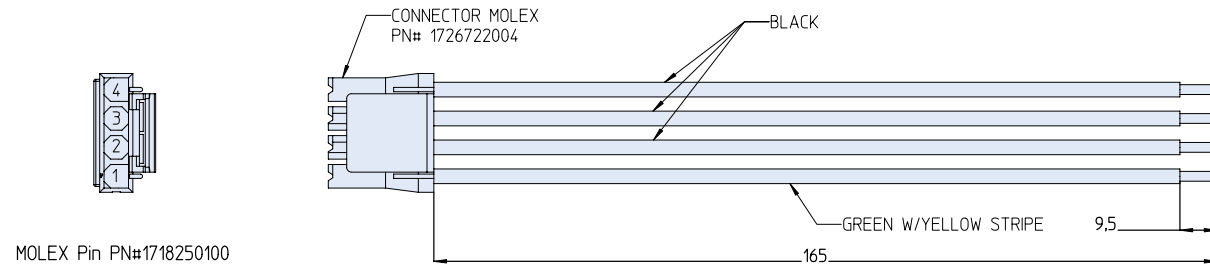


PN 5230002542 Control Harness for BB 158 312 mm 612158 120V 1Ph

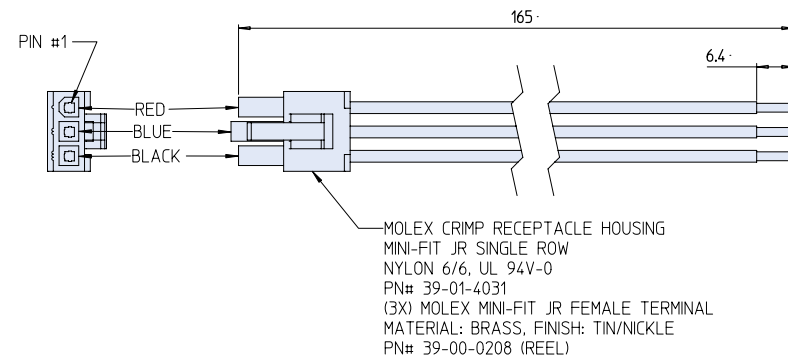




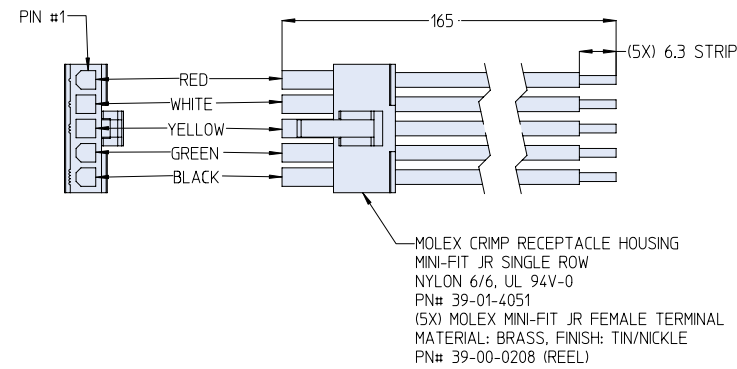
PN 5230002656 Power Harness for BB 158 312 mm 612158 230V 1Ph and 240V 3Ph



PN 5230002545 Status Output Harness for BB 158 312 mm 612158 230V 1Ph and 240V 3Ph



PN 5230002542 Control Harness for BB 158 312 mm 612158 230V 1Ph and 240V 3Ph



For Stepper, Permanent Magnet, and Brushless Motors as well as Brushless Blowers, please contact the head office of AMETEK MAE.

For service requirements on Universal Blowers please contact the distribution network.

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