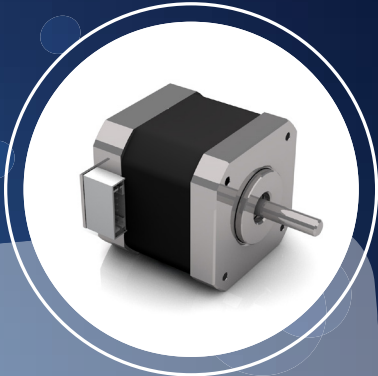


MNE[®]

Motors | Blowers 2020



AMETEK[®]
ADVANCED MOTION SOLUTIONS



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

"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 Dynamic Fluid Solutions, 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.

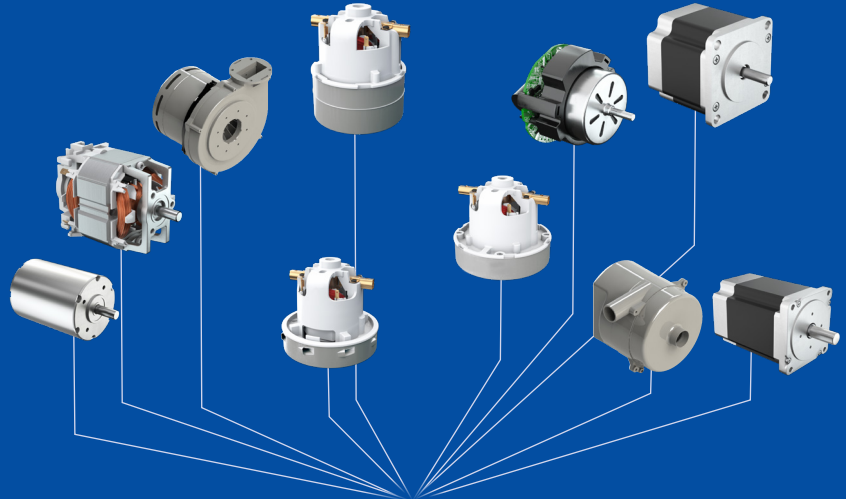
>> Our Products

» **Blowers**

Universal AC/DC
Brushless AC/DC

» **Motors**

Universal AC/DC
Permanent Magnet DC
Stepper
Brushless AC/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 other 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 and dry 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 312mm 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.

PERMANENT MAGNET DC

» Series PM

The MAE permanent magnet DC motors utilize a two-pole design, and are available in various stack heights and two diameters. 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.

STEPPER

» Series ST

Offered in the four 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.

AMNEE

<i>Overview</i>	
Page 6-19	Products Overview & Product Combination Possibilities
Page 20 - 49	Brushless Blowers Series TB Series BB 
Page 50 - 55	Permanent Magnet DC Motor Series PM 
Page 56 - 63	Stepper Motors Series ST 
Page 64 - 71	Brushless AC/DC Motors Series BL 
Page 72 - 90	Gearboxes, Brakes, Encoders, Controllers, Accessories

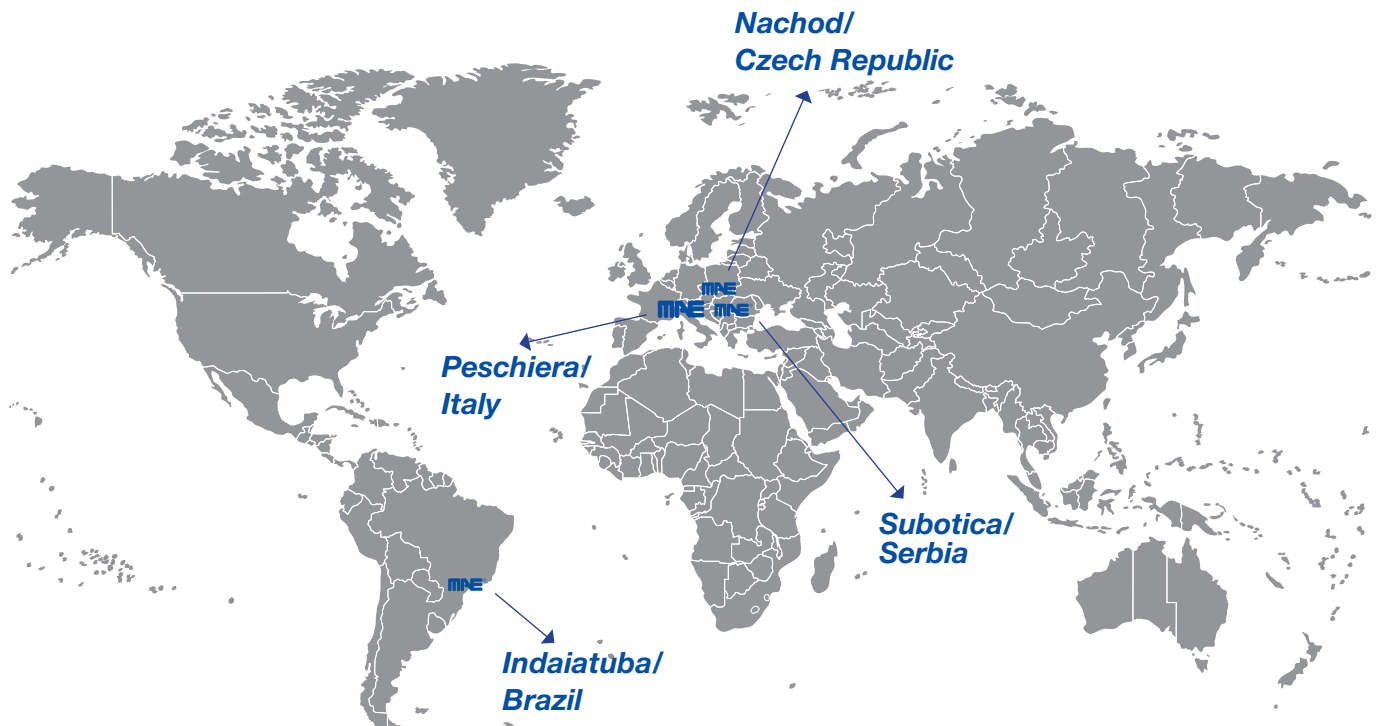


Market Segments

- » Industrial
- » Health Care
- » Basic Automation
- » Building
- » Motive
- » Cleaning & Life Style

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.*



Our planet - Our responsibility

» **Energy class**

Our motors and blower provide efficiency exceeding international standards

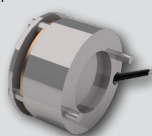

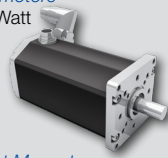
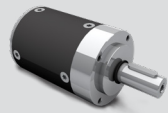
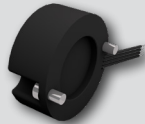
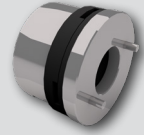

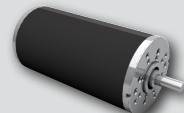
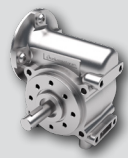
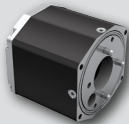




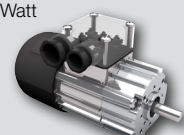
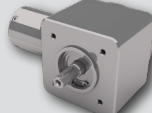
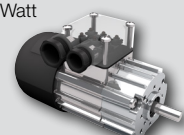

» **Reduced emission production**

MAE continues to make extensive improvements at its factories to reduce CO₂ emission.

>> Modular system MAE and Dunkermotoren

Flexibility, delivery performance and complete motion solutions

Standardized motors, gears and modular accessories are available with flexibility to address specific requirements in complete motion solutions.

ENCODERS	BRAKES	CONTROLLERS	MOTORS	GEARBOXES
<p><i>Incremental Encoder</i> up to 4096 ppr</p> 	<p><i>Power-off Brakes</i> 0.2 - 7 Nm</p> 	<p><i>Integrated Controller</i></p> 	<p><i>Brushless DC-Servomotors</i> 6 - 3900 Watt</p> 	<p><i>Planetary Gearboxes</i> 0.3 - 160 Nm</p> 
<p><i>Magnetic Pulse Generators</i> 4 ppr</p> 	<p><i>Power-on Brakes</i> 0.2 - 3 Nm</p> 	<p><i>External Controller</i></p> 	<p><i>Permanent Magnet DC-Motors</i> 3 - 370 Watt</p> 	<p><i>Worm Gearboxes</i> 0.75 - 30 Nm</p> 
<p><i>Absolute Encoder</i> Up to 4096 ppr</p> 		<p>dGo/ dMove/ dPro</p> 	<p><i>Stepper Motors</i> 0,09 - 14 Nm</p> 	<p><i>Spirotec Gearboxes</i> 9 - 18 Nm</p> 
		<p>EtherCAT</p> 	<p><i>AC-Motors</i> 5 - 100 Watt</p> 	<p><i>Bevel Gearboxes</i> 1.6 - 120 Nm</p> 
		<p>CANopen</p> 	<p><i>Universal Motors</i> 150 - 1200 Watt</p> 	<p><i>Spindels and Cylinders</i> 450 - 2500 N</p> 
			<p><i>AC/DC Blowers</i> Thru-Flow, Bypass</p> 	
			<p><i>Linear Motors</i> 19 - 3690 N</p> 	



	TU 82 107mm			TU 82 130mm		
Series	TU 82 107mm			TU 82 130mm		
Type	Thru Flow			Thru Flow		
Fan housing diameter (mm)	107			130		
Fan stages	1 - 2			1		
Max Air Flow (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						



	TU 95 139mm		TU 93 / TU 96 145mm	
<i>Series</i>	TU 95 139mm		TU 93 / TU 96 145mm	
<i>Type</i>	Thru Flow		Thru Flow	
<i>Fan housing diameter (mm)</i>	139		145	
<i>Fan stages</i>	1 - 2		1 - 2 - 3	
<i>Max Air Flow (l/sec)</i>	75	55	68	49
<i>Max Pressure (kPa)</i>	33.6	21.5	33.6	23.7
<i>Rated voltage (V)</i>	100 - 250 AC	230 AC	100 - 250 AC	230 AC
<i>Max power input (W)</i>	2200	864	1660	842
<i>Max efficiency (η%)</i>	46.7%	42.8%	38.0%	44.6

<i>Fan cover protection</i>				
<i>Inlet Tube</i>				
<i>Thermal protection</i>				
<i>EMC components</i>				
<i>UL approval</i>				
<i>Double shaft</i>				



	BU 93 107mm	BU 82 130mm		
Series	BU 93 107mm	BU 82 130mm		
Type	Bypass	Bypass		
Fan housing diameter (mm)	107	130		
Fan stages	1 - 2	1		
Max Air Flow (l/sec)	51	56	67	60
Max Pressure (kPa)	23.2	18.4	29.5	19.7
Rated voltage (V)	100 - 250 AC	12 / 18 / 24 / 36 DC	100 - 250 AC	230 AC
Max power input (W)	1320	890	1660	960
Max efficiency (η%)	27.3%	41.5%	44.2%	48.1%

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

				
Series	BU 95 143mm	BU 93 / BU 96 145mm		BU 110 182mm
Type	Bypass	Bypass		Bypass
Fan housing diameter (mm)	143	145		182
Fan stages	1 - 2 - 3	1 - 2 - 3		2 - 3
Max Air Flow (l/sec)	72	39	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%	31.7	37.6%	34.0%

<i>Fan cover protection</i>				
<i>Inlet Tube</i>				
<i>Thermal protection</i>				
<i>Water separator</i>				
<i>EMC components</i>				
<i>UL approval</i>				
<i>Double shaft</i>				

				
<i>Series</i>	BB 00 130mm	TB 89 145mm	BB 89 145mm	BB 89 193mm
<i>Family</i>	Microjammer	-	-	-
<i>Type</i>	ByPass	Thru Flow	ByPass	ByPass
<i>Fan housing diameter (mm)</i>	130	145	145	193
<i>Fan stages</i>	1	1 - 2	1 - 3	1
<i>Max Air Flow (m³/h)</i>	45	230	319	200
<i>Max Pressure (kPa)</i>	12.7	16.0	19.5	3.7
<i>Rated voltage (VDC)</i>	12 / 24	24 / 48 / 72	24 / 48 / 72	12 / 24
<i>Max power input (W)</i>	170	600	580	300
<i>Speed control signal</i>	On-Off / 0 - 4 V	On-Off / 0 - 10 V	On-Off / 0 - 10 V	On-Off / 0 - 10 V / PWM
<i>Output signal</i>	Tach Out	Tach Out	Tach Out	Tach Out

<i>External controller</i>				
<i>Potentiometer for speed calibration</i>				

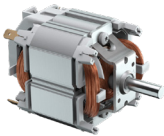
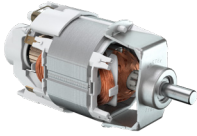
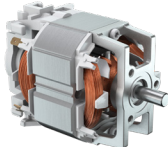
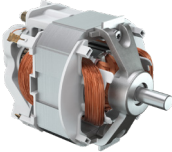
Preference
 On request
 Not Applicable

				
<i>Series</i>	BB 00 76mm	BB 00 84mm	BB 00 114mm	BB 00 127mm
<i>Family</i>	Microjammer	Microjammer	Microjammer	Minjammer
<i>Type</i>	ByPass	ByPass	ByPass	ByPass
<i>Fan housing diameter (mm)</i>	76	84	114	127
<i>Fan stages</i>	1	1	1	1
<i>Max Air Flow (m³/h)</i>	40	12	18	76
<i>Max Pressure (kPa)</i>	6.2	7.0	9.4	6.2
<i>Rated voltage (VDC)</i>	12 / 24	12 / 24	12 / 24	12 / 24
<i>Max power input (W)</i>	70	30	70	150
<i>Speed control signal</i>	On-Off / 0 - 4 V	On-Off / 0 - 4 V	On-Off / 0 - 4 V	On-Off / 0 - 4 V
<i>Output signal</i>	Tach Out	Tach Out	Tach Out	
<i>External controller</i>				

<i>Series</i>	TB 89 145mm	BB 89 145mm	BB 89 193mm	BB 89 226mm	BB 158 312mm
<i>Family</i>	-	-	-	-	-
<i>Type</i>	Thru Flow	ByPass	ByPass	ByPass	ByPass
<i>Fan housing diameter (mm)</i>	145	145	193	226	312
<i>Fan stages</i>	1 - 2	1 - 3	1	1	1
<i>Max Air Flow (m³/h)</i>	221	455	400	930	2130
<i>Max Pressure (kPa)</i>	14.2	42.0	10.8	3.5	6.5
<i>Rated voltage (VAC)</i>	100-240 / 230	100-240 / 230	100-240 / 230	100-240 / 230	120 / 230 1ph 240 3ph
<i>Max power input (W)</i>	600	1400	1400	1400	4000
<i>Speed control signal</i>	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
<i>Output signal</i>	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out	Tach Out / Failure Out

<i>Universal Voltage (100-240 VAC)</i>					
<i>Potentiometer for speed calibration</i>					
<i>Three phase AC input</i>					

Preference
 On request
 Not Applicable

				
Series	DU 56	DU 58	DU 76	DU 93
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


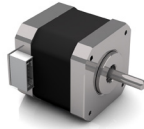
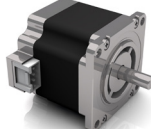
Thermal Protection				
Double insulation				
Gearbox				
Ventilation (internal or external)				
Multiple speeds				
Double shaft				
UL approval				



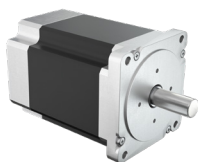
	PM 62	PM 77
<i>Series</i>	PM 62	PM 77
<i>Stack length (mm)</i>	x25 / x30 / x40	x25 / x30 / x37 / x40 / x50
<i>Rated output power (W)</i>	57-123	125-171
<i>Rated voltage (VDC)</i>	12 / 24 / 48 / 100-240	12 / 24 / 48 / 100-240
<i>Speed range (Rpm)</i>	3000 - 9000	2200 - 3500
<i>Rated torque (Ncm)</i>	6-20	34-55

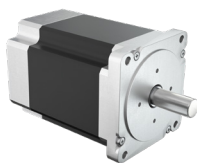

<i>EMC components</i>		
<i>Thermal protection</i>		
<i>Ventilation (internal or external)</i>		
<i>Gearbox</i>		
<i>Double shaft</i>		
<i>UL approval</i>		

Preference
 On request
 Not Applicable

			
<i>Series</i>	ST 16	ST 17	ST 23
<i>Motor length (Nema)</i>	x07	x14 / x16 / x20	x16 / x21 / x31
<i>Rated current (A)</i>	0.6	0.4 - 2.00	1.00 - 4.00
<i>Holding torque (Ncm)</i>	8.7	27 - 57	70 - 210
<i>Rotor inertia (gcm²)</i>	11	40 - 83	77 - 335
<i>Maximum voltage (VDC)</i>	40	50	80
<i>Number of wires</i>	4	4	4
<i>Connection</i>	Leads	Connector	Connector

<i>Double shaft</i>			
<i>External controller</i>	DSE-I DSE-C	DSE-I DSE-C	DSE-I DSE-C
<i>Encoder</i>	RE 30	RE 30	RE 30
<i>Planetary gearbox</i>		PLG 42 SP	PLG 52 SP



		
<i>Series</i>	ST 34	ST 42
<i>Motor Length (Nema)</i>	x37 / x48 / x55 / x62	x70 / x88
<i>Rated current (A)</i>	3.00 - 8.00	3.40 - 9.00
<i>Holding torque (Ncm)</i>	520 - 1200	990 - 1425
<i>Rotor inertia (gcm²)</i>	3460 - 8269	5500 / 8300
<i>Maximum voltage (VDC)</i>	160	140
<i>Number of wires</i>	4	8
<i>Connection</i>	Leads	Leads

<i>Double shaft</i>		
<i>External controller</i>	DSE-I DSE-C	DSE-I DSE-C
<i>Encoder</i>	RE 30	RE 30
<i>Planetary gearbox</i>	PLG 75 SP	

Preference On request Not Applicable



	BL 42	BL 57	
<i>Series</i>	BL 42	BL 57	
<i>Number of poles</i>	6	4	8
<i>Motor length (mm)</i>		x56 / x76 / x96	x56 / x76 / x96
<i>Rated output power (W)</i>	119	46 - 153	33 - 111
<i>Rated voltage (VDC)</i>	230 AC	24 / 40	24 / 40
<i>Rated speed (Rpm)</i>	28000	3850 - 4180	2850 - 3350
<i>Rated torque (Ncm)</i>	4	11 - 35	11-33

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



Brushless Blowers

>> Series TB

>> Series BB



Brushless Blowers DC

Page 22	TB 89 145mm DC 622 089 Blower Thru Flow Brushless
Page 24	BB 89 145mm 1-Stage DC 612 089 Blower ByPass Brushless
Page 26	BB 89 145mm 2-Stage DC 612 089 Blower ByPass Brushless
Page 28	BB 89 145mm 3-Stage DC 612 089 Blower ByPass Brushless

Brushless Blowers AC

Page 30	TB 89 145mm AC 622 089 Blower Thru Flow Brushless
Page 32	BB 89 145mm 1-Stage AC Standard-Flow 612 089 Blower ByPass Brushless
Page 34	BB 89 145mm 1-Stage AC High-Flow 612 089 Blower ByPass Brushless
Page 36	BB 89 145mm 2-Stage AC 612 089 Blower ByPass Brushless
Page 38	BB 89 145mm 3-Stage AC 612 089 Blower ByPass Brushless
Page 40	BB 89 193mm AC 612 089 Blower ByPass Brushless
Page 42	BB 89 226mm AC 612 089 Blower ByPass Brushless
Page 44	BB 158 312mm AC 1Ph 612 158 Blower ByPass Brushless
Page 46	BB 158 312mm AC 3Ph 612 158 Blower ByPass Brushless

>> TB 89 145mm DC | 622 089

Blower Thru Flow Brushless

- » 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	1-Stage	2-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
standard features					
Speed command input	VDC	0-10	0-10	0-10	0-10
Tach output	ppr	2	2	2	2

Options

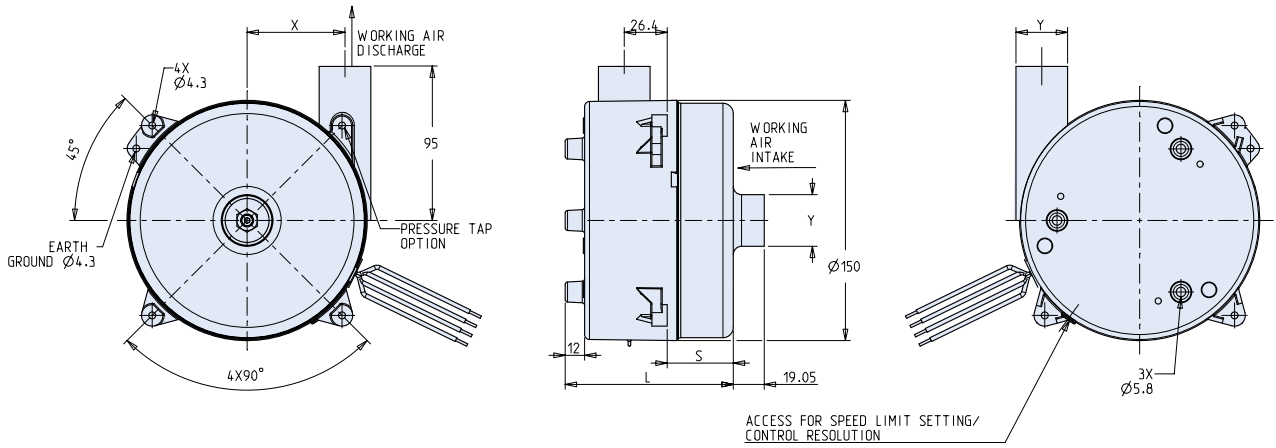
A) mechanical

- » 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

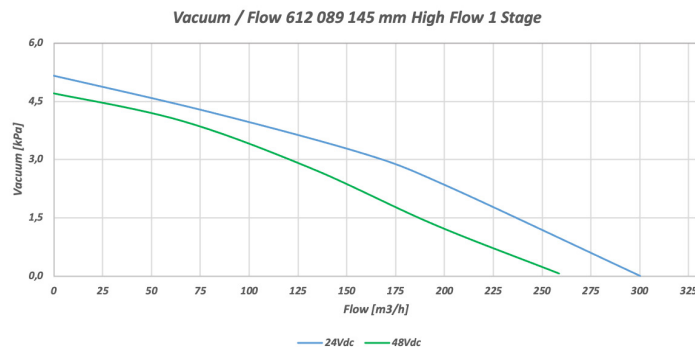
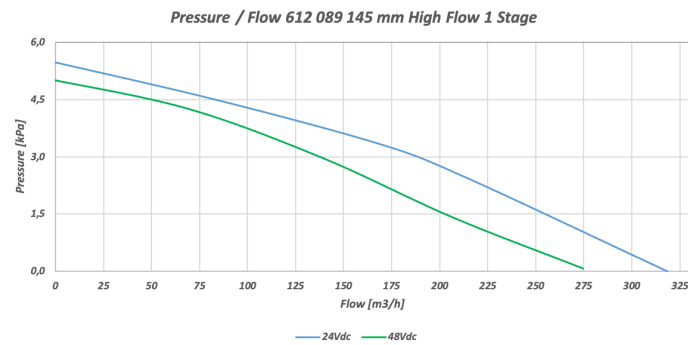


Lead wires

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	31.8

Characteristic diagram



» BB 89 145mm 1-Stage DC | 612 089

Blower ByPass Brushless

- » 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
standard features			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

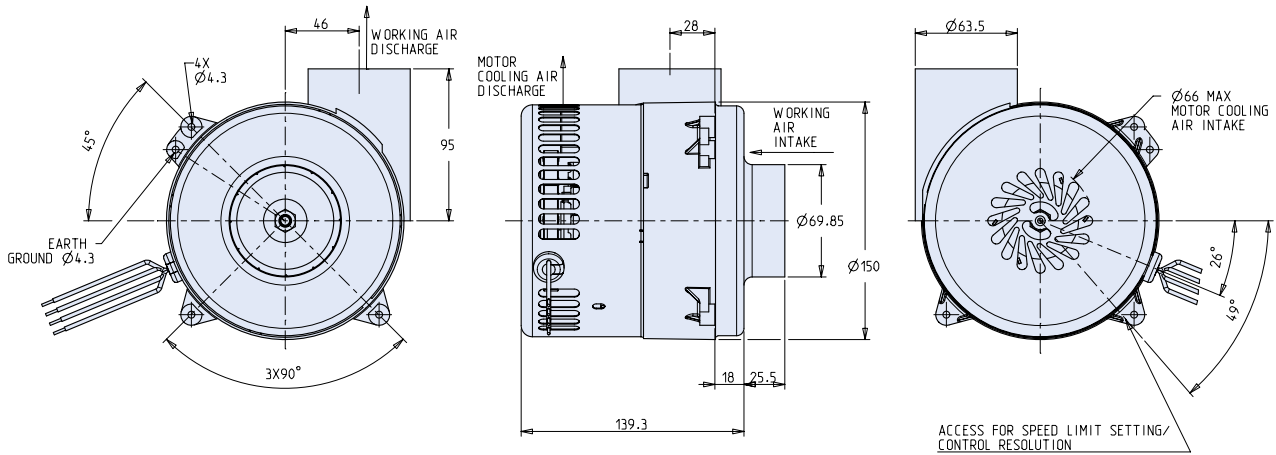
A) mechanical

- » 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

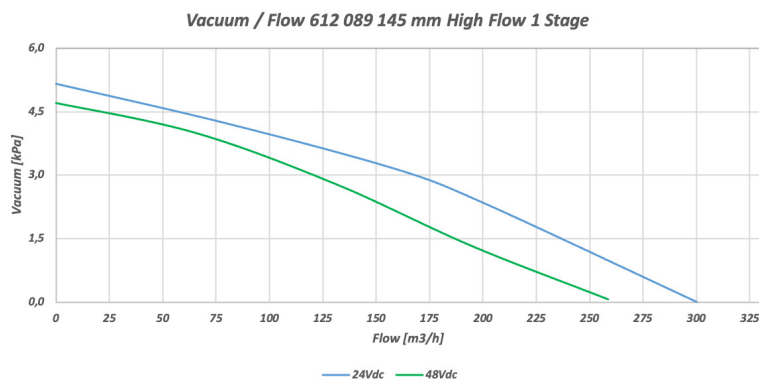
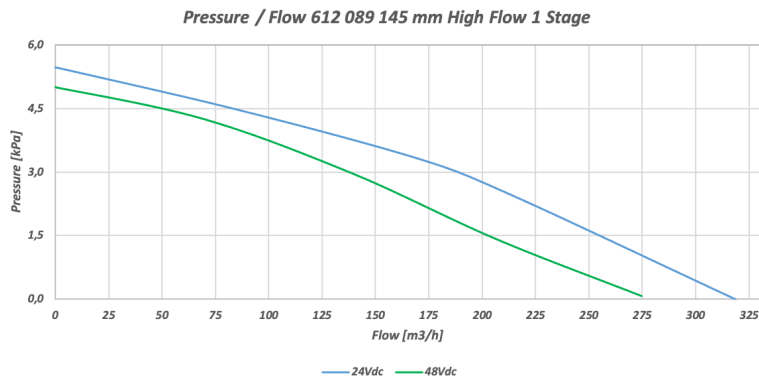


Lead wires

Colour	Function
Red ●	VDC
Black ●	Common
Orange ●	Speed Command
Blue ●	Tach Output

See page 49 for Mechanical Options

Characteristic diagram



» BB 89 145mm 2-Stage DC | 612 089

Blower ByPass Brushless

- » 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
standard features			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

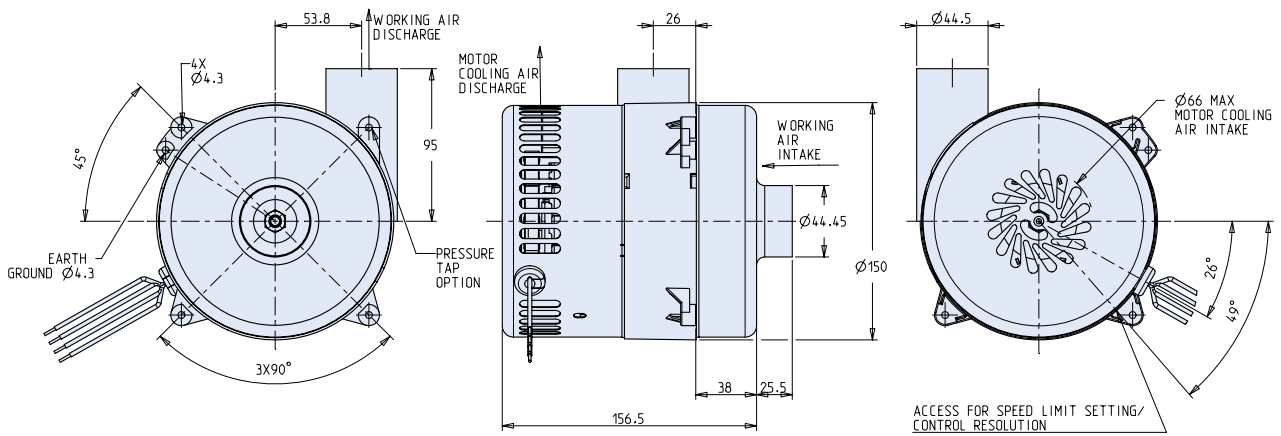
A) mechanical

- » 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

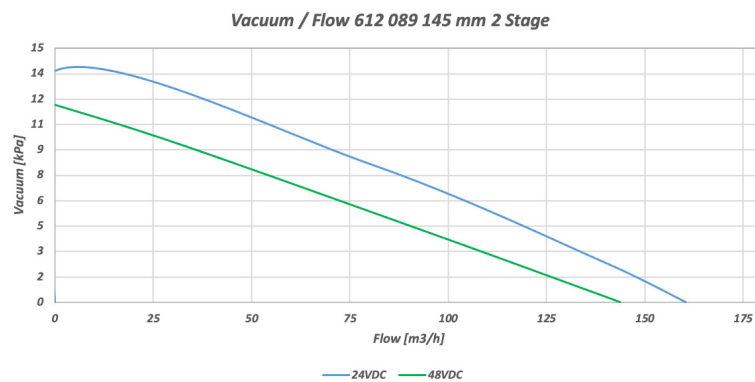
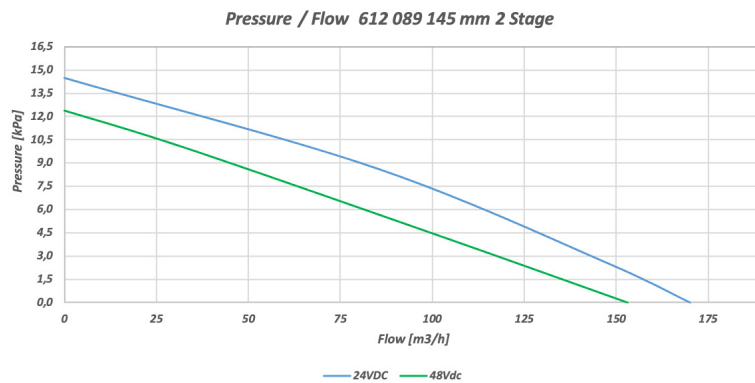


Lead wires

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

See page 49 for Mechanical Options

Characteristic diagram



>> BB 89 145mm 3-Stage DC | 612 089

Blower ByPass Brushless

- » 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
<i>standard features</i>			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

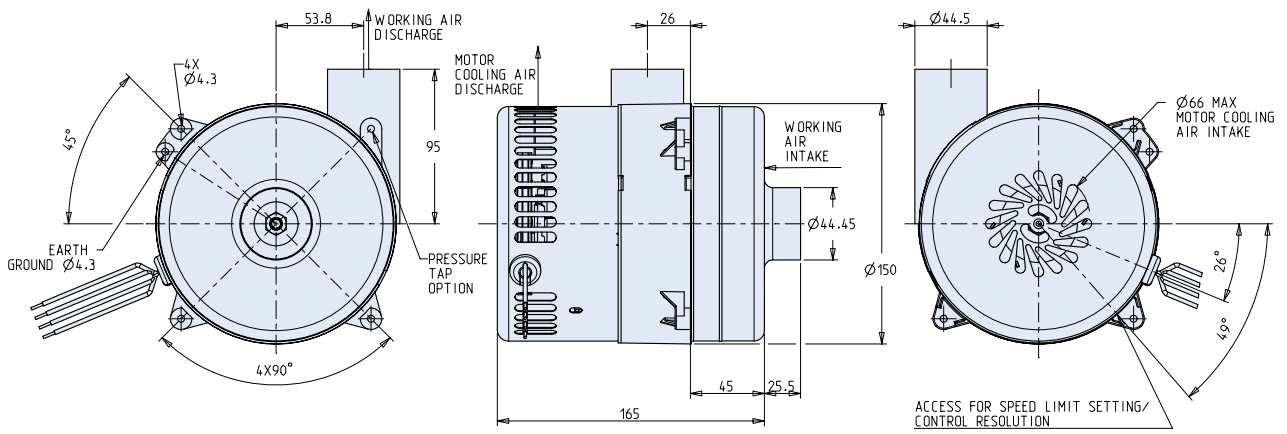
A) mechanical

- » 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

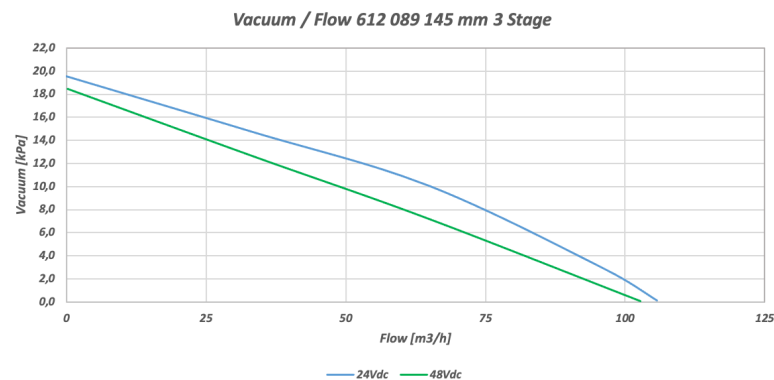
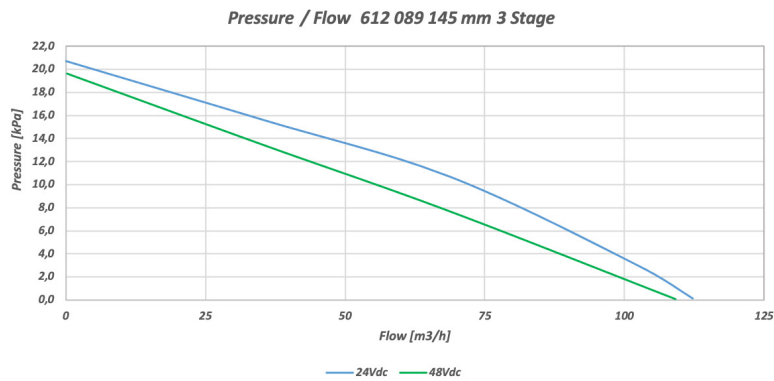


Lead wires

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

See page 49 for Mechanical Options

Characteristic diagram



» TB 89 145mm AC | 622 089

Blower Thru Flow Brushless

- » 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
standard features			
Speed command input	VDC	0-10	0-10

Options

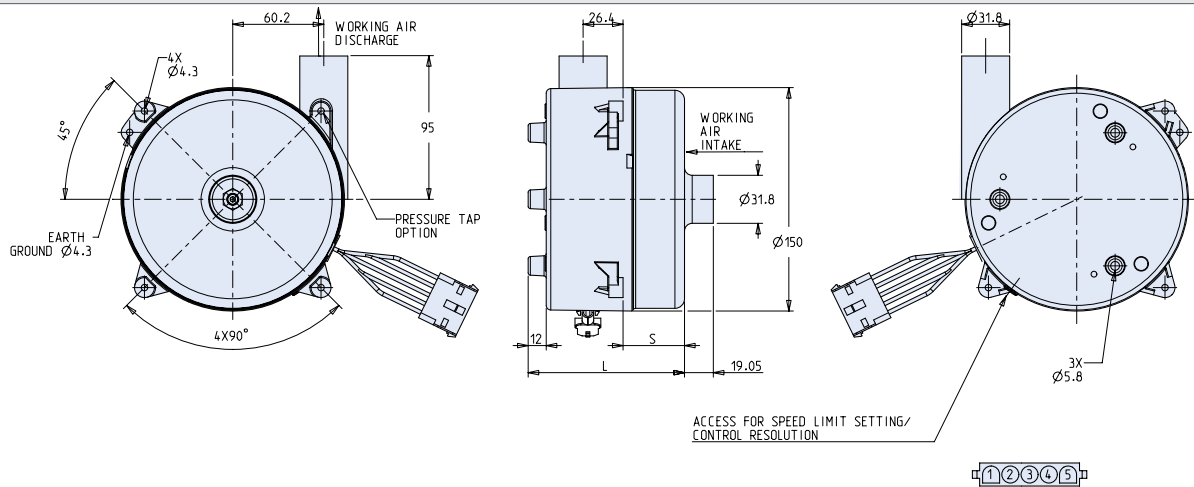
A) mechanical

- » 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

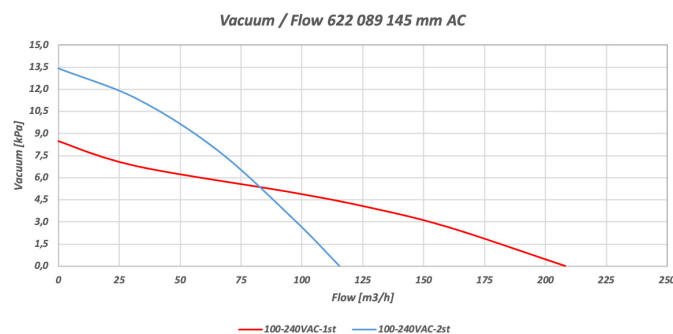
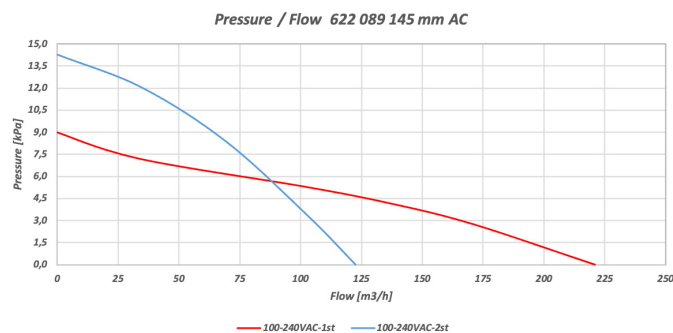
Pin #	Function
1	Not Used
2	Not Used

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



» BB 89 145mm 1-Stage AC Standard-Flow | 612 089

Blower ByPass Brushless

- » 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
standard features				
Speed command input	VDC	0-10	0-10	0-10

Options

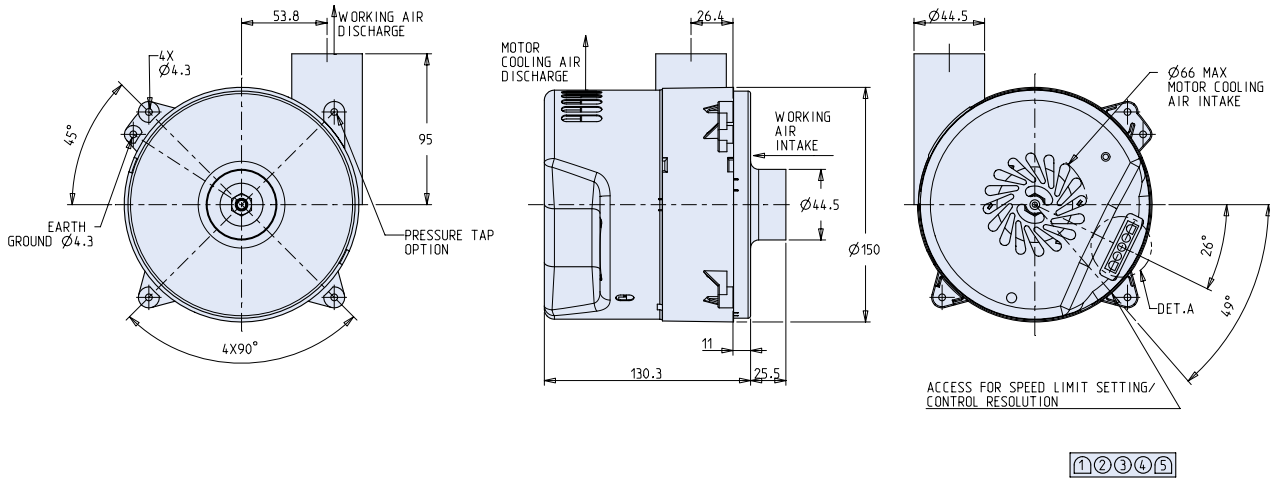
A) mechanical

- » 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



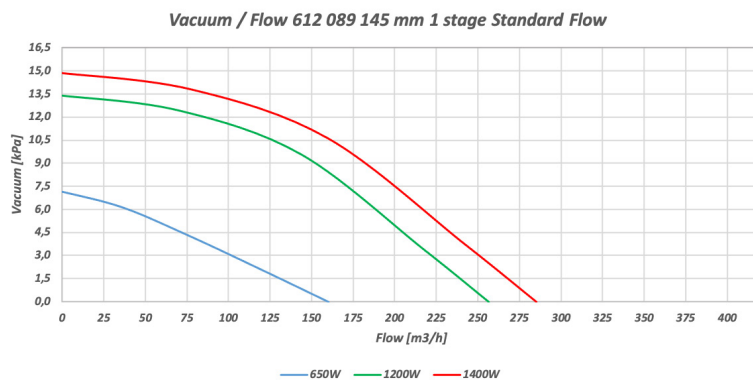
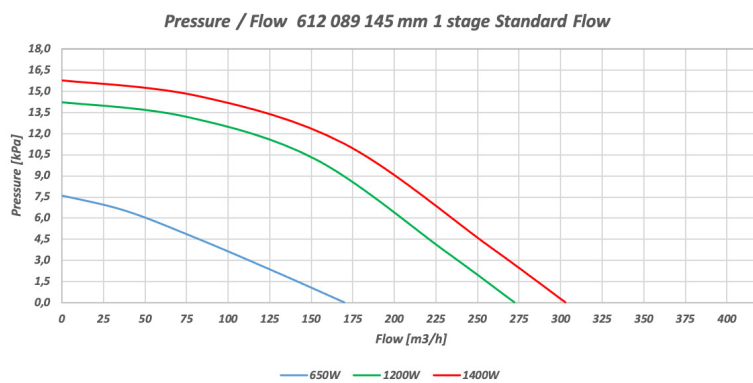
See page 48 for Mechanical Options
See page 88 for Connector Harnesses

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



» BB 89 145mm 1-Stage AC High-Flow | 612 089

Blower ByPass Brushless

- » 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
standard features				
Speed command input	VDC	0-10	0-10	0-10

Options

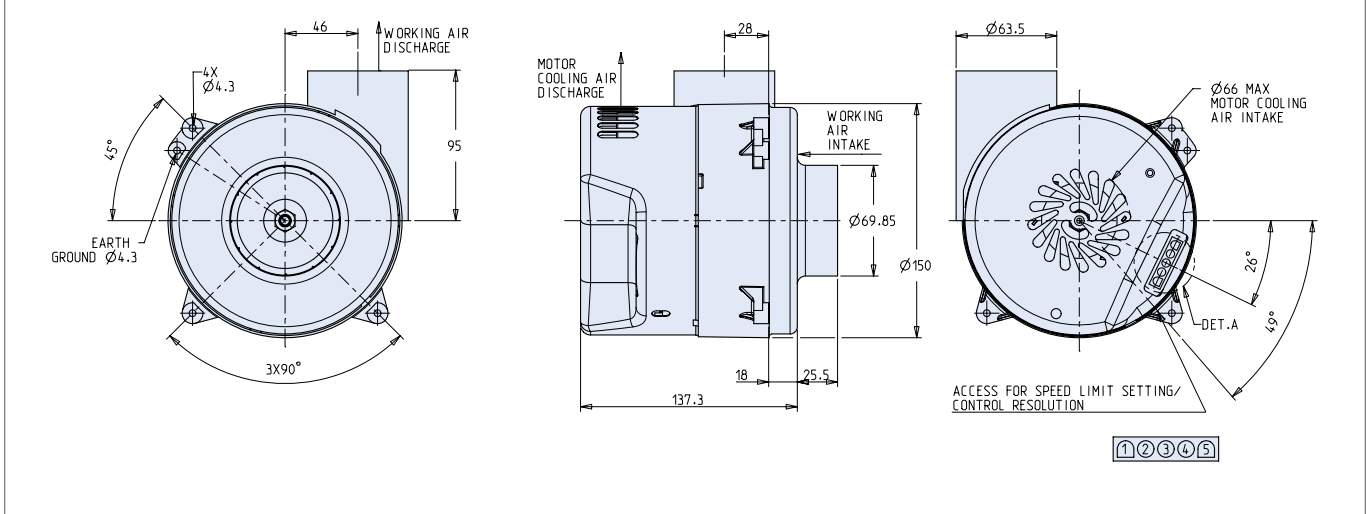
A) mechanical

- » 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



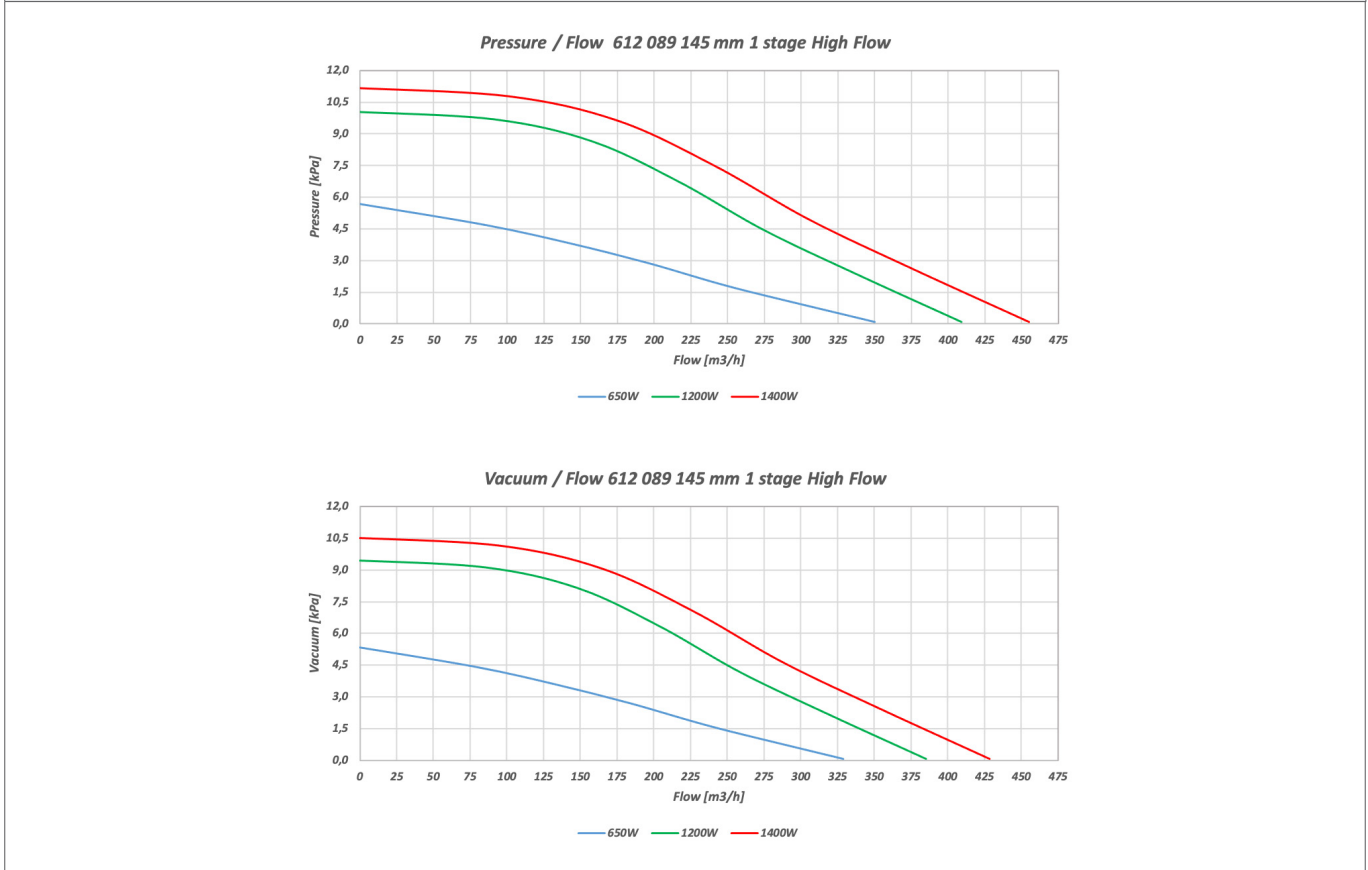
See page 48 for Mechanical Options
See page 88 for Connector Harnesses

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



» BB 89 145mm 2-Stage AC | 612 089

Blower ByPass Brushless

- » 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
standard features				
Speed command input	VDC	0-10	0-10	0-10

Options

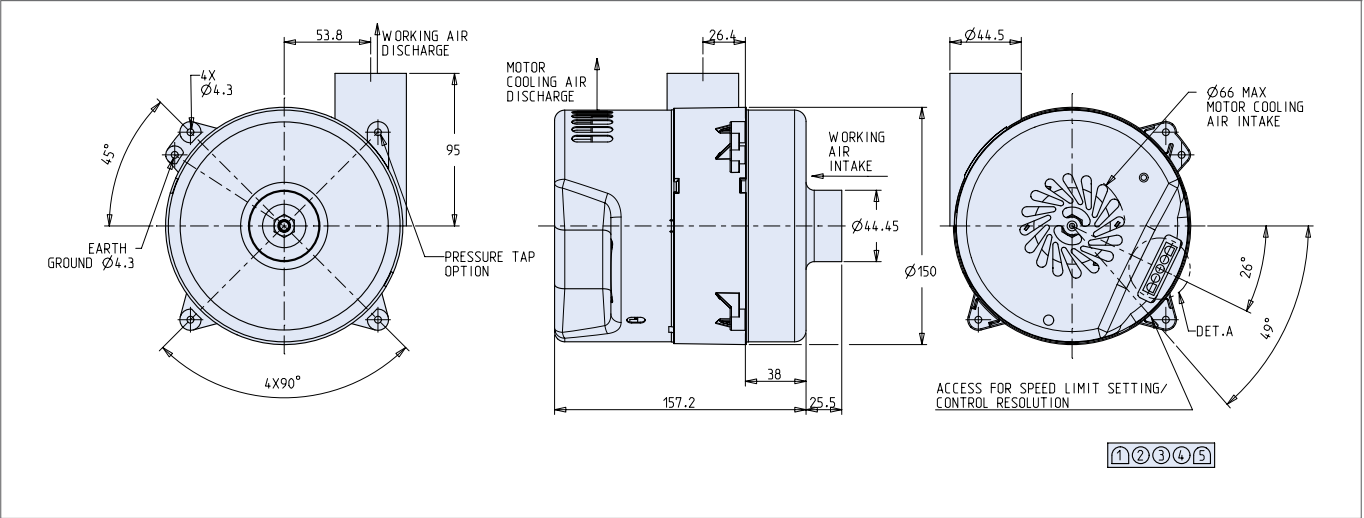
A) mechanical

- » 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



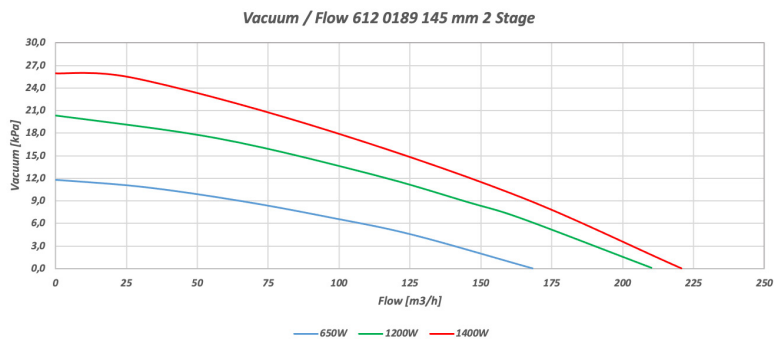
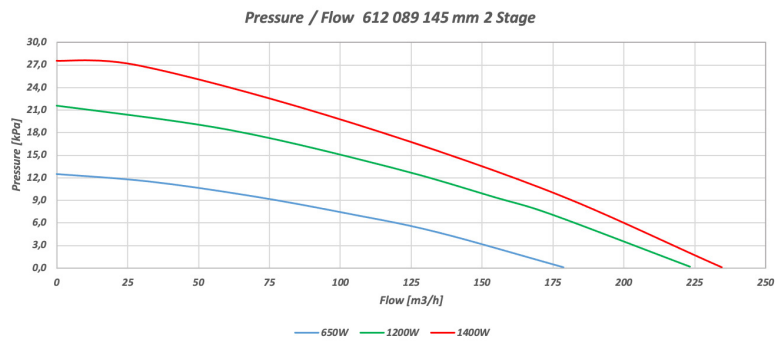
See page 48 for Mechanical Options
See page 88 for Connector Harnesses

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



» BB 89 145mm 3-Stage AC | 612 089

Blower ByPass Brushless

- » 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
standard features				
Speed command input	VDC	0-10	0-10	0-10

Options

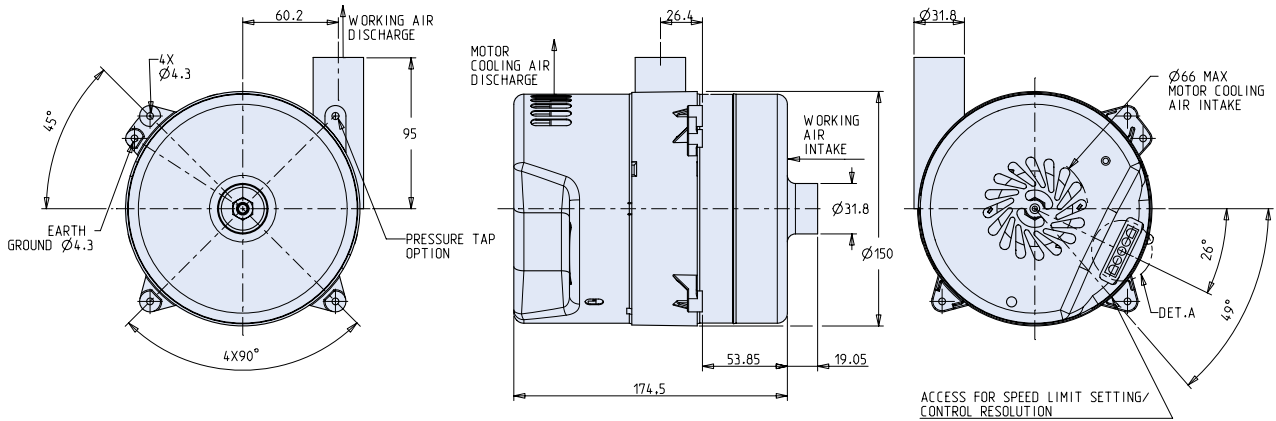
A) mechanical

- » 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



①②③④⑤

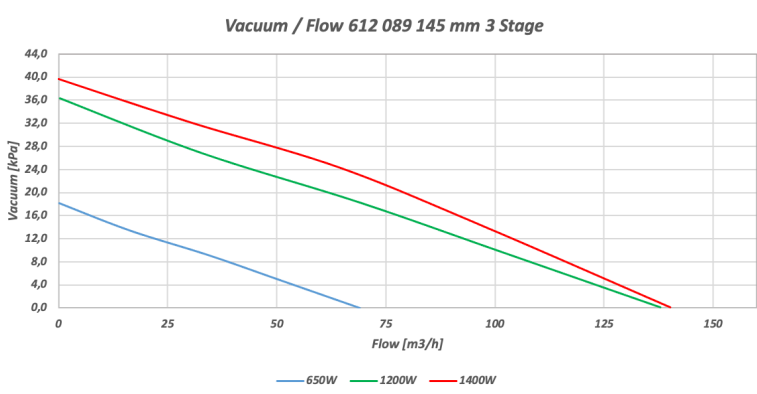
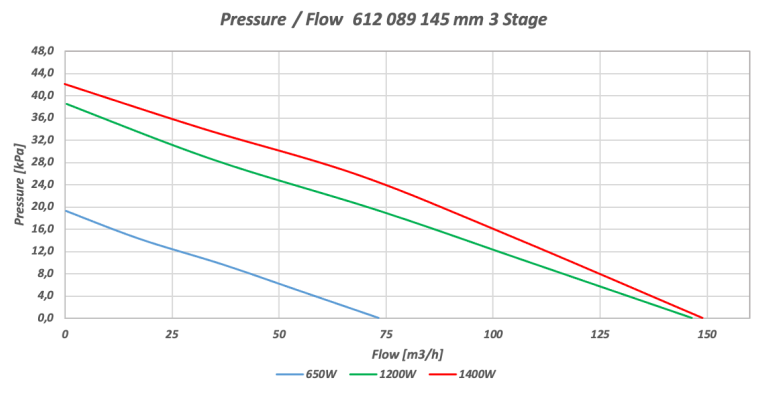
See page 48 for Mechanical Options
See page 88 for Connector Harnesses

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

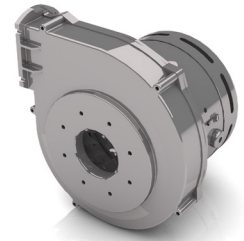


>> BB 89 193mm AC | 612 089

Blower ByPass Brushless

- » 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
standard features				
Speed command input	VDC	0-10	0-10	0-10
Tach output	ppr	2	2	2

Options

A) mechanical

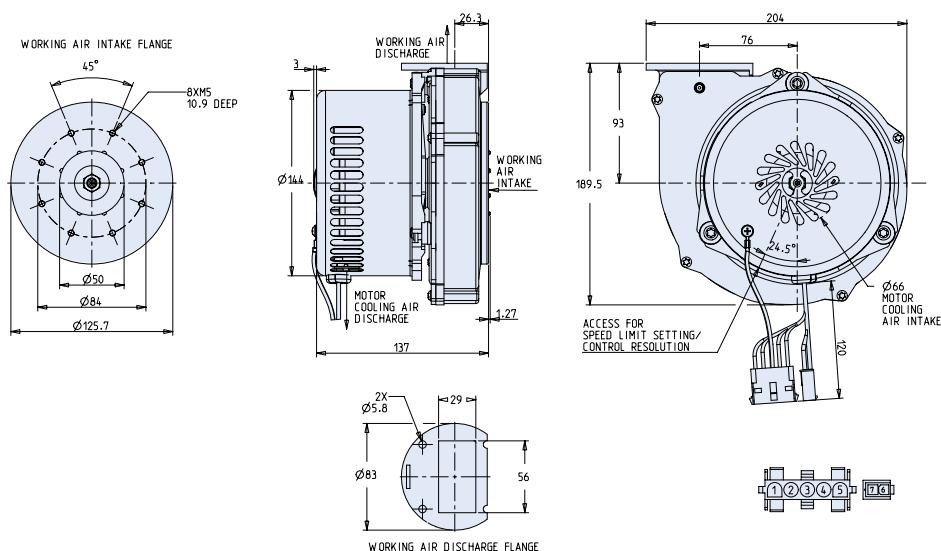
- » enhanced corrosion protection
- » various exhaust flange details
- » various inlet flange details

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
- » auxiliary DC voltage output
- » without digital output (cable/connector removed)

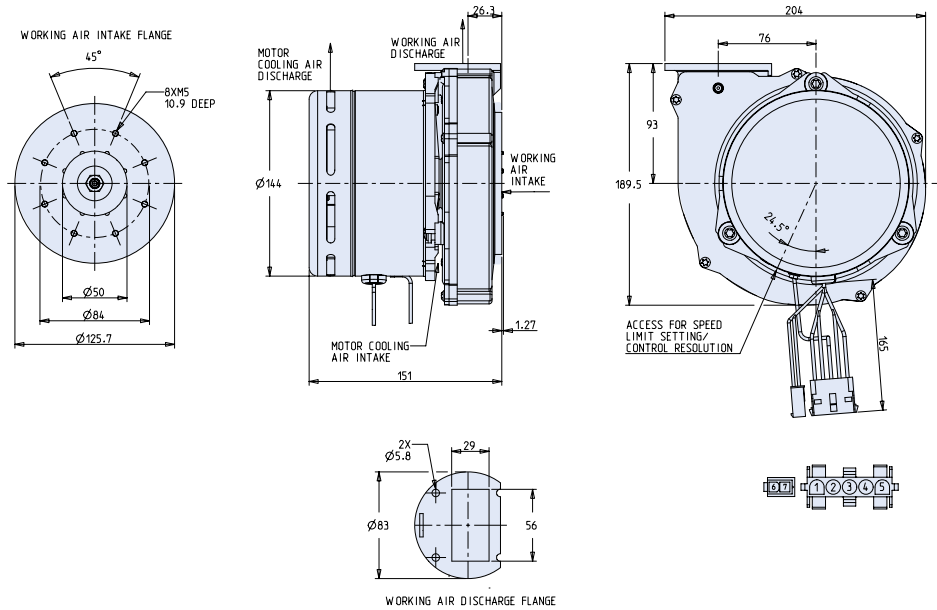
Dimensions in mm

650 W

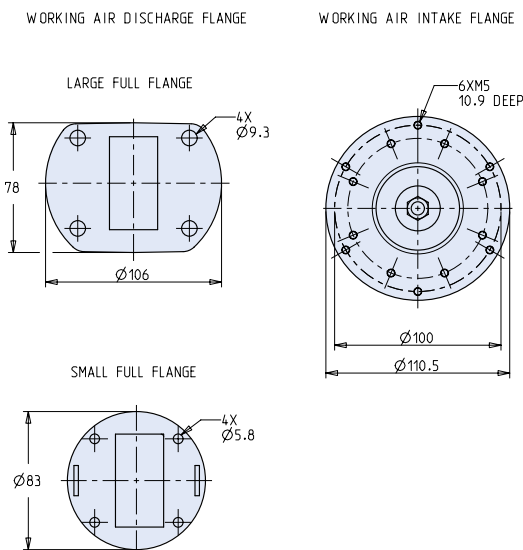


Dimensions in mm

1200/1400 W



Mechanical options



Speed Control options and Electrical Connection

Pin Assignment

05P AMP Mate-N-Lok 350810-1		2 Pole Molex 39-01-3029	
Male Pins AMP 350873-1		Male Pins Molex PN 39000061	
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 - 20mV +10V nominal, min 10% duty cycle

Pin #	Function
1	Speed Command PWM
2	Speed Command PWM

Current: mA - 20mA +10V nominal

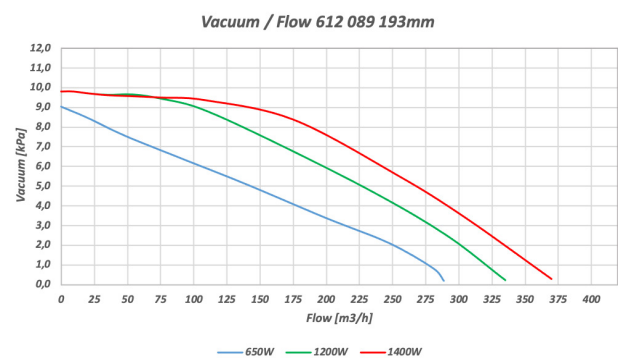
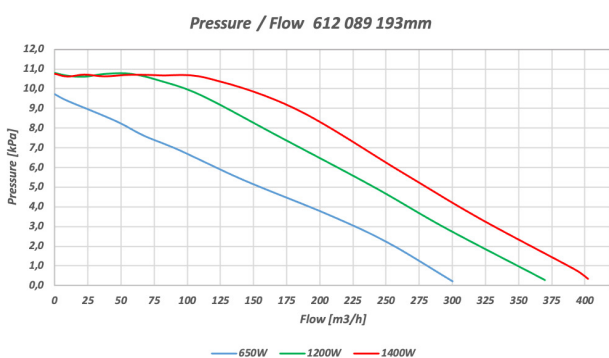
Pin #	Function
1	Speed Command Current
2	Speed Command Current

On/Off: Without Electrical Speed Control

Pin #	Function
1	Not Used
2	Not Used

Molex connector (Pin # 6 & 7) not present

Characteristic diagram



» BB 89 226mm AC | 612 089

Blower ByPass Brushless

- » 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
standard features				
Speed command input	VDC	0-10	0-10	0-10
Tach output	ppr	2	2	2

Options

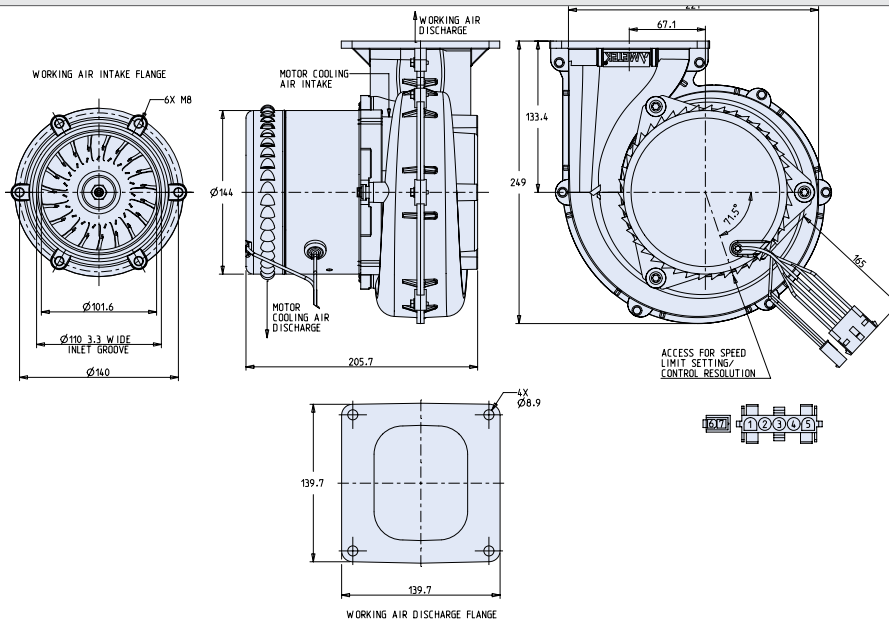
A) mechanical

- » 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
- » 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

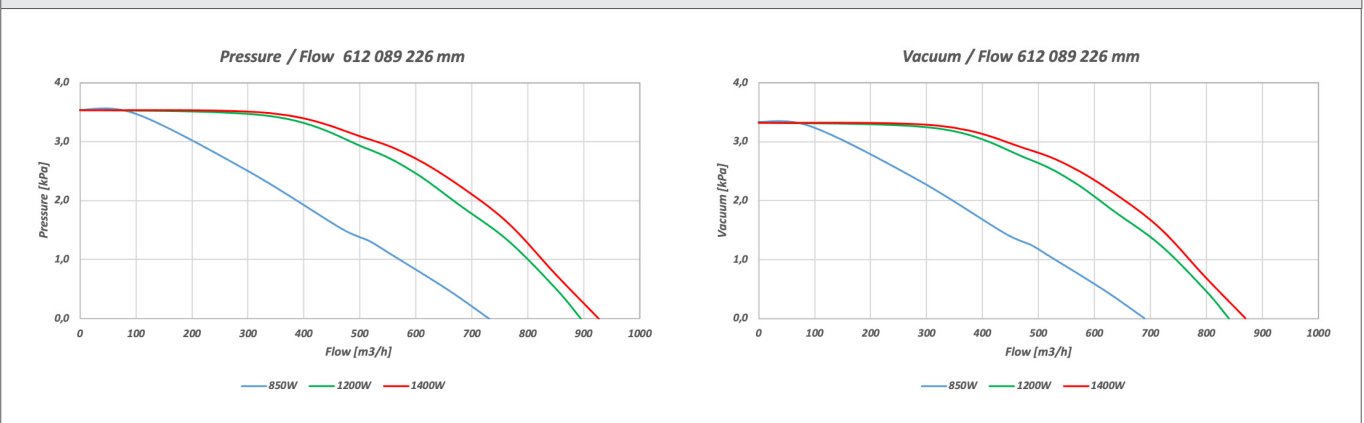
Pin #	Function
1	Not Used
2	Not Used

Molex connector (Pin # 6 & 7) not present

Pin Assignment

Pin #	Function	Pin #	Function
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



» BB 158 312mm AC 1Ph | 612 158

Blower ByPass Brushless

- » 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
standard features			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

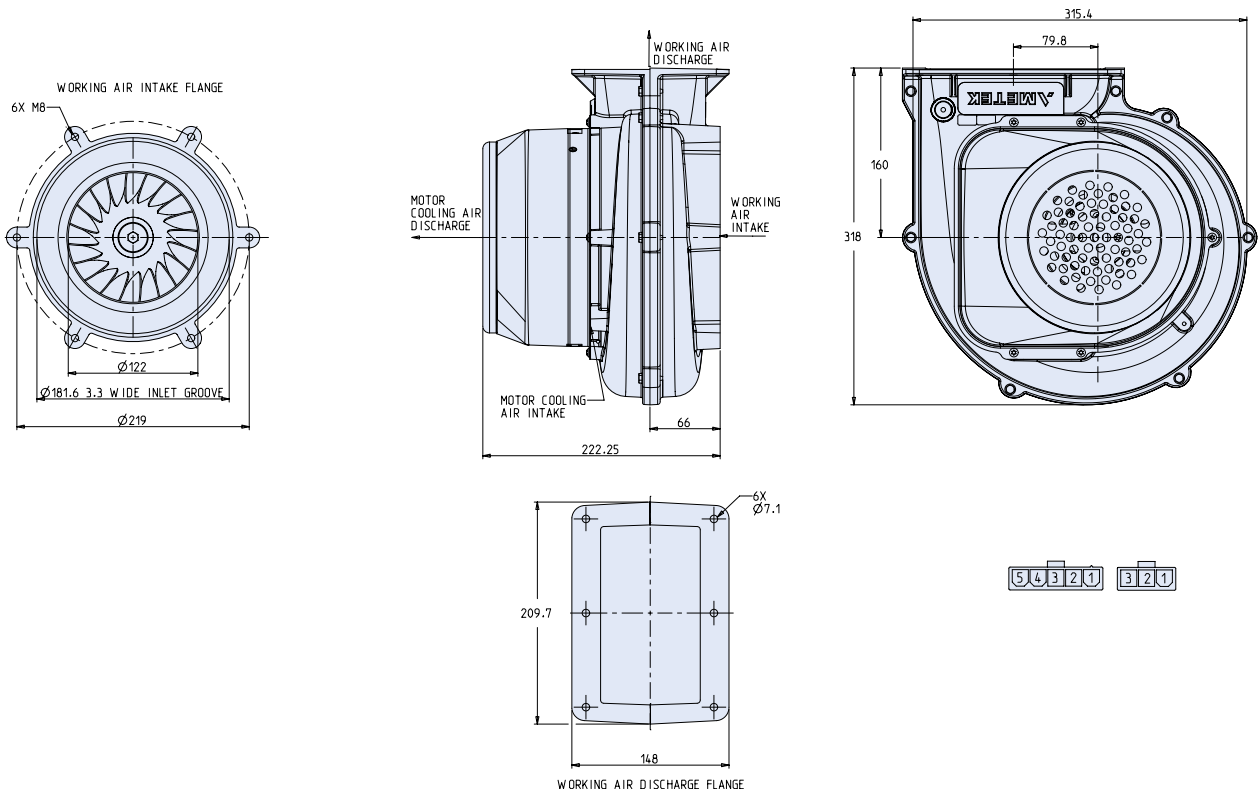
A) mechanical

- » large exhaust flange

B) electrical / software

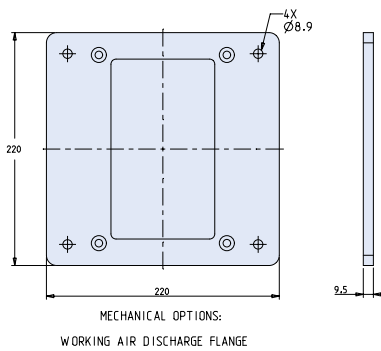
- » various digital output signals (tach-out 2ppr std.)
- » tach output resolution (up to 6 ppr)
- » speed command input (PWM or 5-20mA)
- » open-loop speed control
- » customized software functions
- » external potentiometer input
- » auxiliary DC voltage output
- » without digital output

Dimensions in mm



Mechanical options

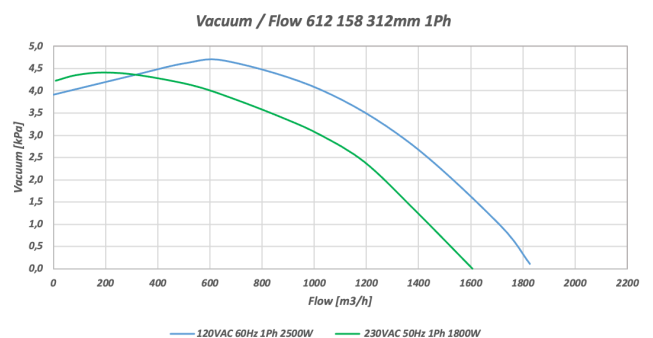
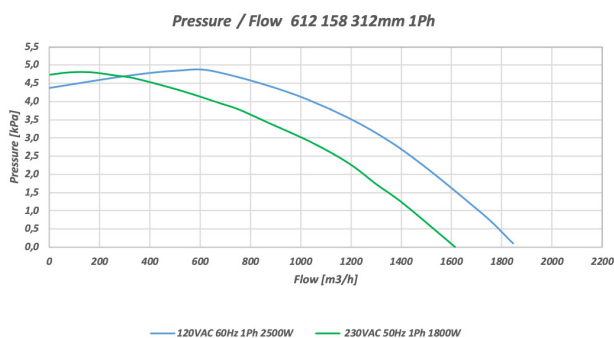
See page 89 and 90
for Connector Harnesses



Pin Assignment

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

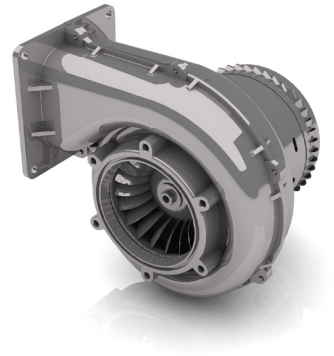
Characteristic diagram



BB 158 312mm AC 3Ph | 612 158

Blower ByPass Brushless

- » 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
standard features			
Speed command input	VDC	0-10	0-10
Tach output	ppr	2	2

Options

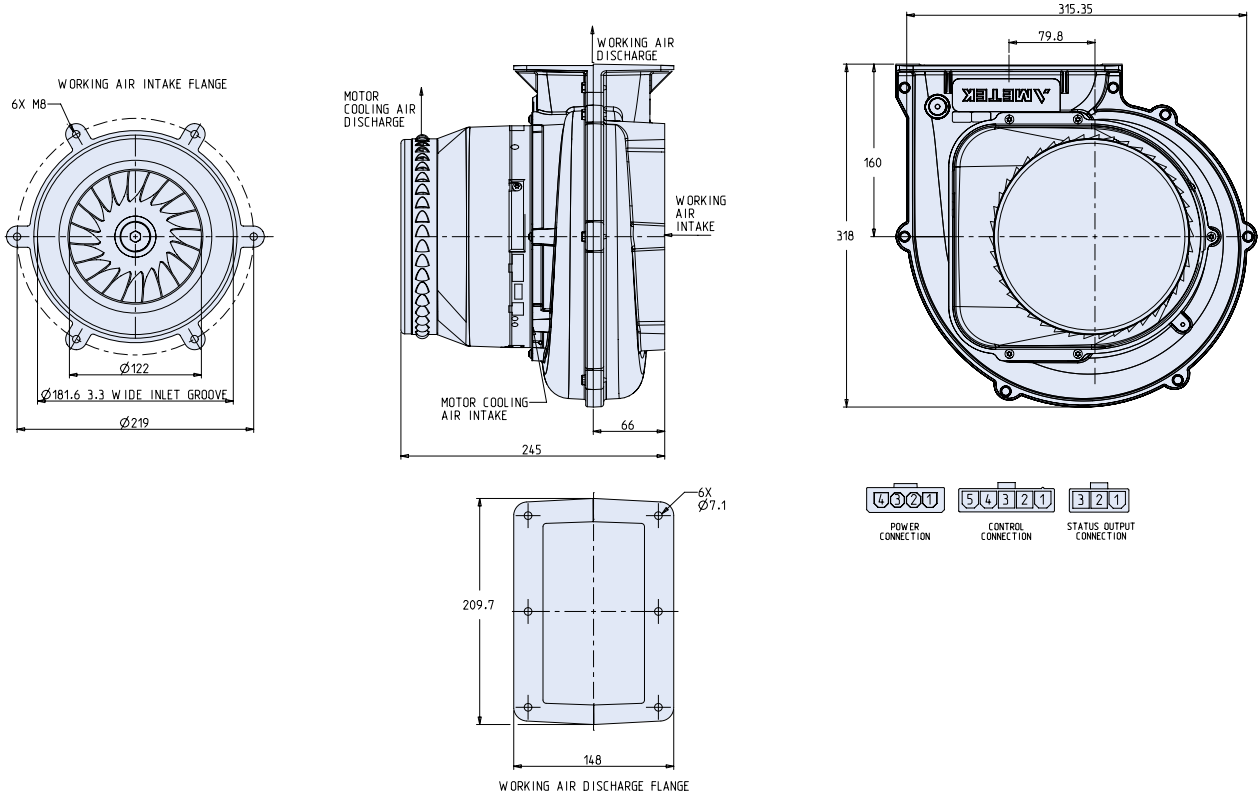
A) mechanical

- » large exhaust flange

B) electrical / software

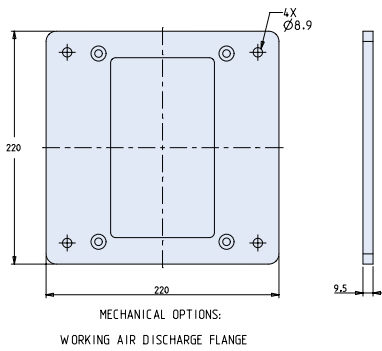
- » various digital output signals (tach-out 2ppr std.)
- » tach output resolution (up to 6 ppr)
- » speed command input (PWM or 5-20mA)
- » open-loop speed control
- » customized software functions
- » external potentiometer input
- » auxiliary DC voltage output
- » without digital output

Dimensions in mm



Mechanical options

See page 90 for Connector Harnesses

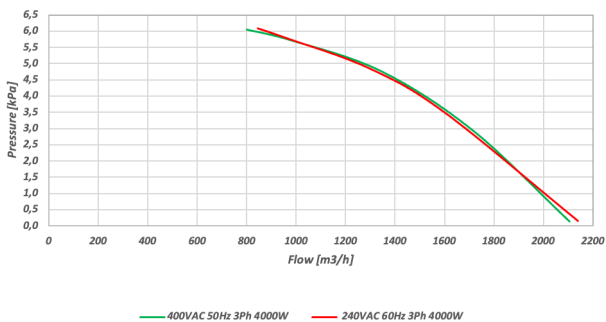


Pin Assignment

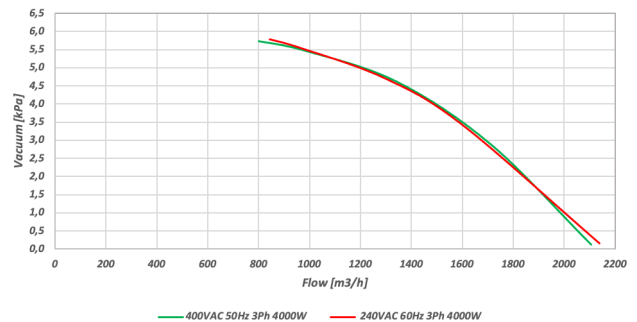
Molex 1720430406		Molex 39-30-3055		Molex 39-30-3035	
Pin #	Function (Power)	Pin #	Function (Control)	Pin #	Function (status output)
1	A/C Input	1	15V-40V External Supply	1	Auxiliary 15VDC Output
2	A/C Input	2	Tach Output	2	Open Collector Output
3	A/C Input	3	Speed Command Input 0..10V	3	Common
4	Ground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

Characteristic diagram

Pressure / Flow 612 158 312mm 3Ph



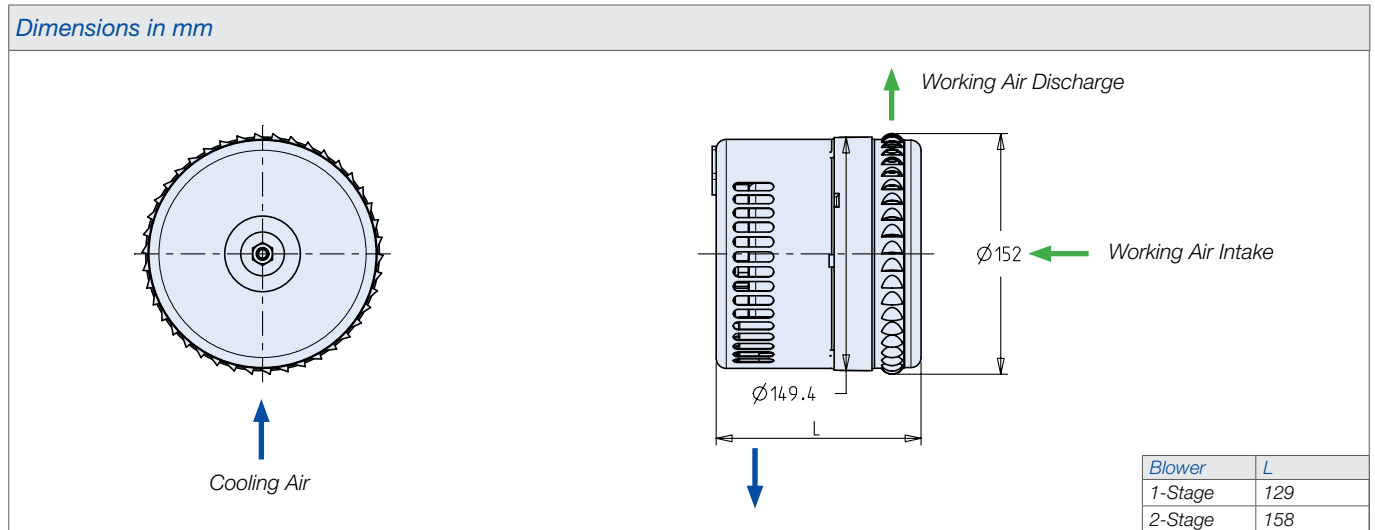
Vacuum / Flow 612 158 312mm 3Ph



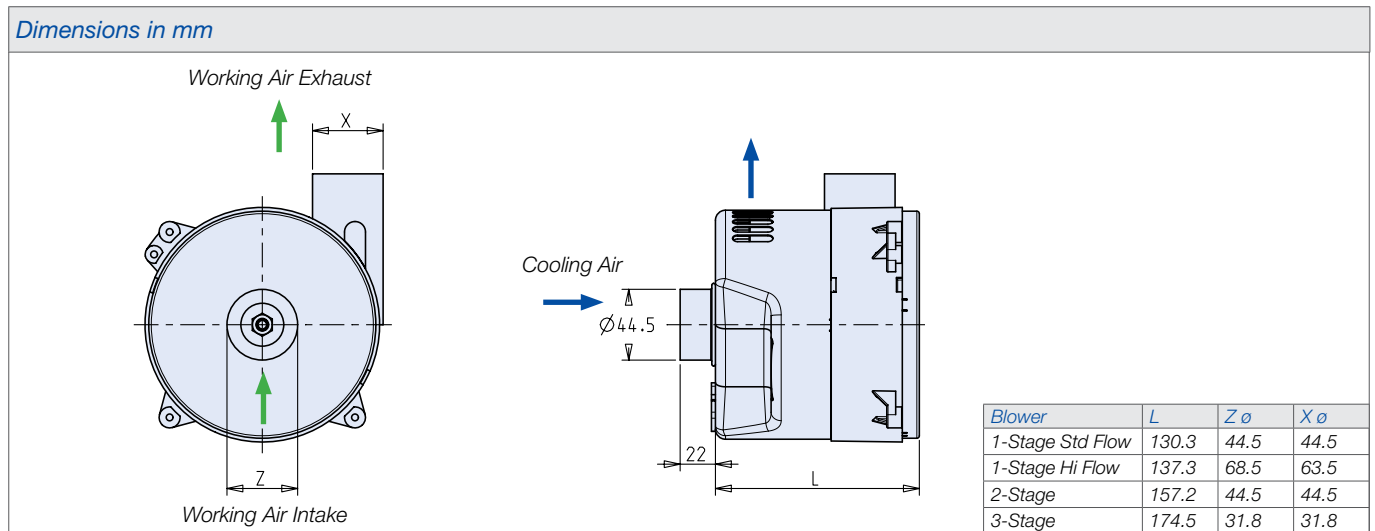
>> BB 89 145mm AC | Mechanical Options

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

Peripheral working air discharge



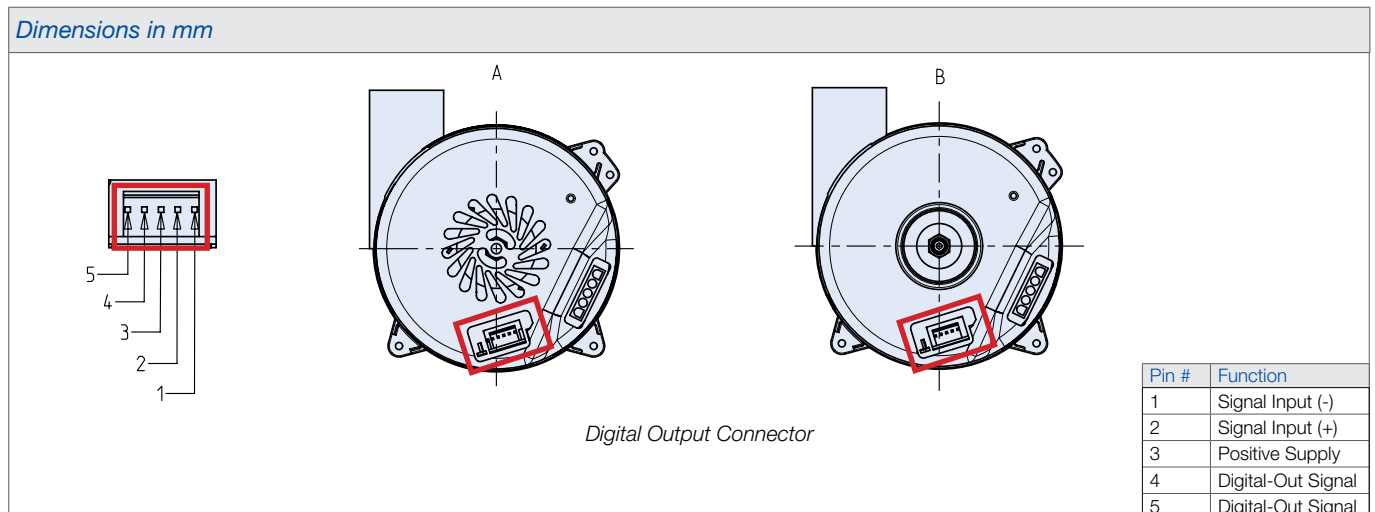
Working air without intake tube and cooling air with intake tube



>> BB 89 145mm AC Digital Output

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

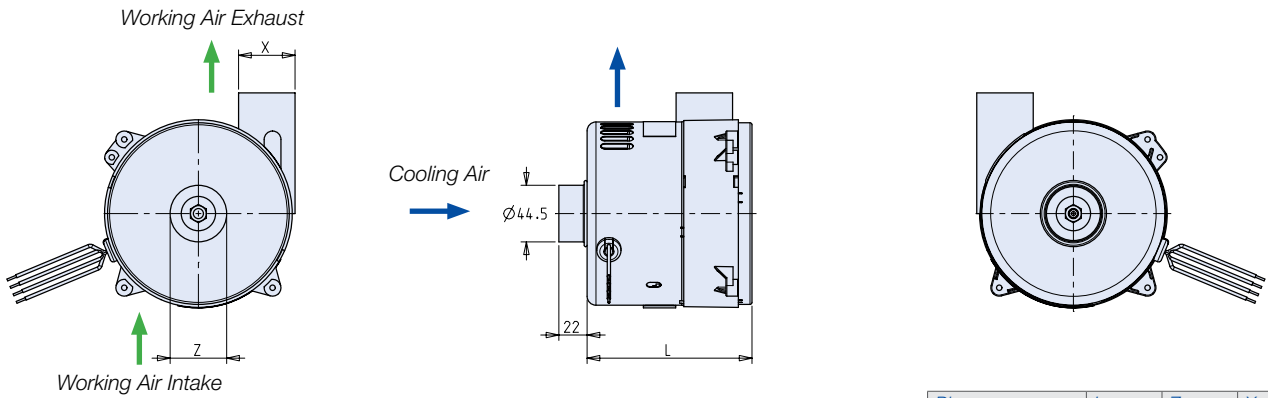
Digital Output and Pin Assignment shown without cooling air intake tube (A) and with cooling air intake tube (B)



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

Working air without intake tube and cooling air with intake tube

Dimensions in mm



Blower	L	Z ϕ	X ϕ
1-Stage	139.3	68.5	63.5
2-Stage	156.5	44.5	44.5
3-Stage	165	44.5	44.5



***Permanent Magnet
DC Motors***

>> Series PM



Permanent Magnet DC Motors

Page 52 PM 62 | 633 062 | Permanent Magnet DC Motor 62 mm

Page 54 PM 77 | 633 077 | Permanent Magnet DC Motor 77mm

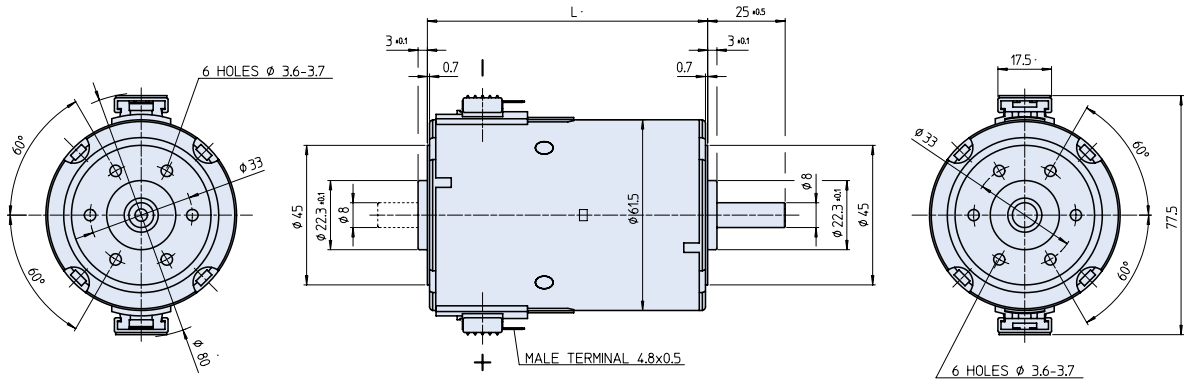
>> PM 62 | 633 062 | Permanent Magnet DC Motor 62mm

- » 2-Pole DC motor
- » Operation in both direction of rotation
- » Replaceable brush system
- » Options with custom shaft length and diameter
- » Hi voltage winding 120V - 230V available



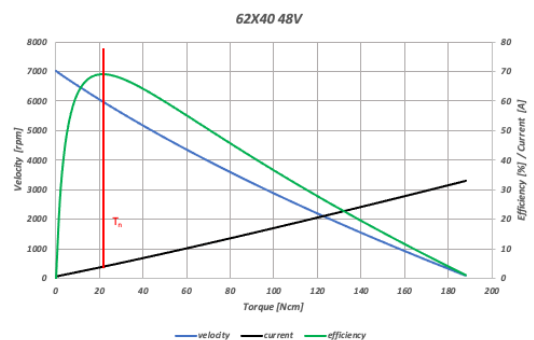
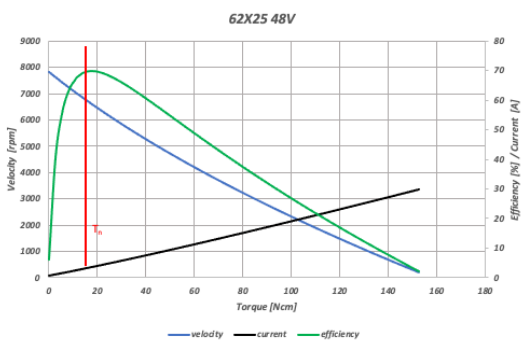
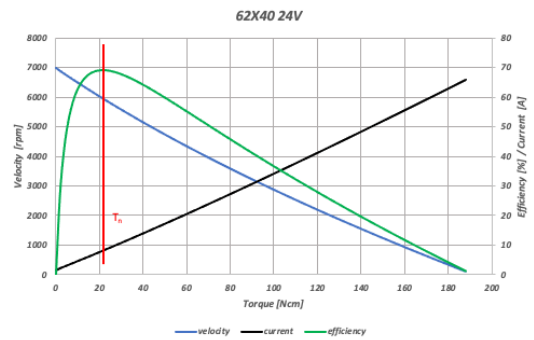
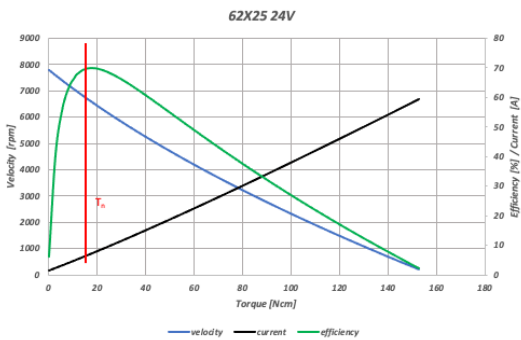
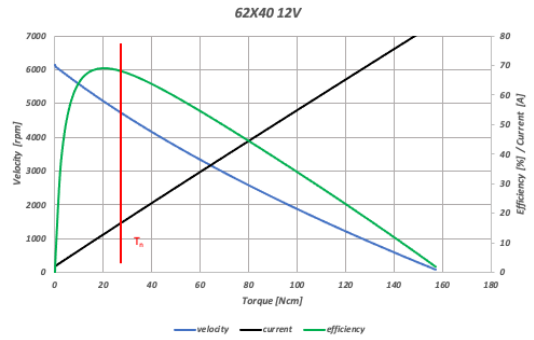
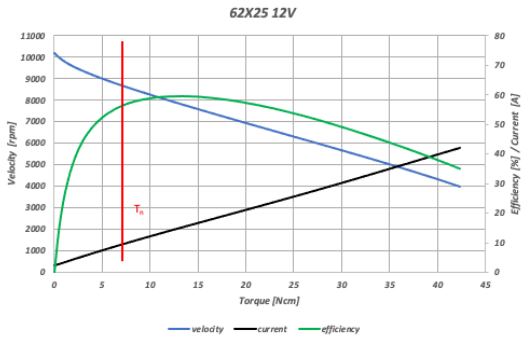
Data		62x25	62x25	62x25	62x40	62x40	62x40
Nominal voltage	VDC	12	24	48	12	24	48
Nominal current	A	8.6	5.0	2.5	14.7	7.2	3.6
Nominal torque	Ncm	6.2	10.9	11.1	23.6	19.1	19.3
Nominal velocity	rpm	8830	7052	7035	4907	6076	6065
Stall torque	Ncm	70	125	155	160	190	190
No load velocity	rpm	10200	7800	7750	6150	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 ²	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



>> PM 77 | 633 077 | Permanent Magnet DC Motor 77mm

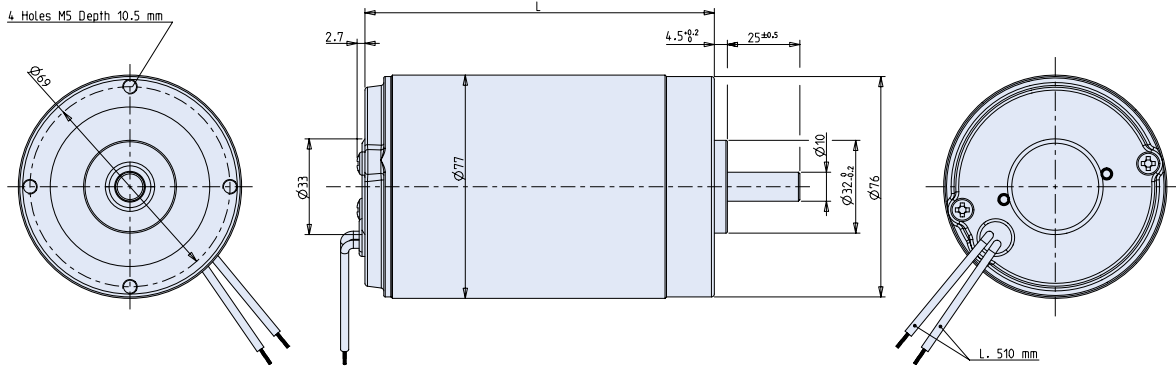
- » 2-Pole DC motor
- » Operation in both direction of rotation
- » Ball bearing at motor output shaft

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



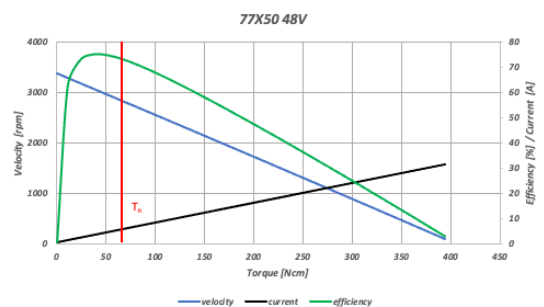
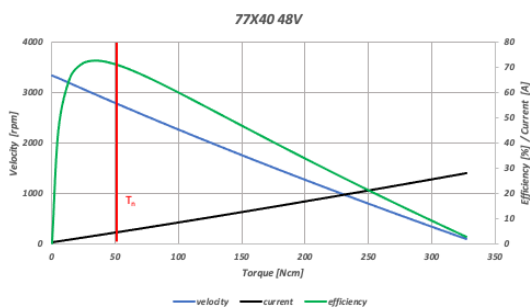
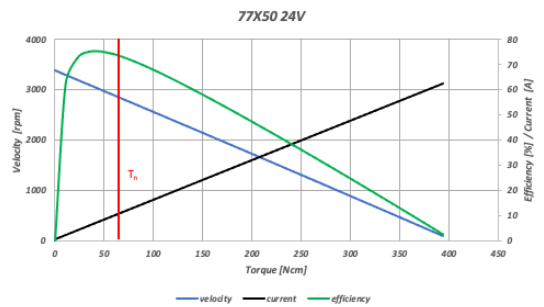
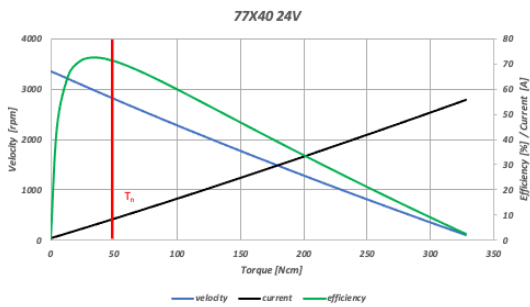
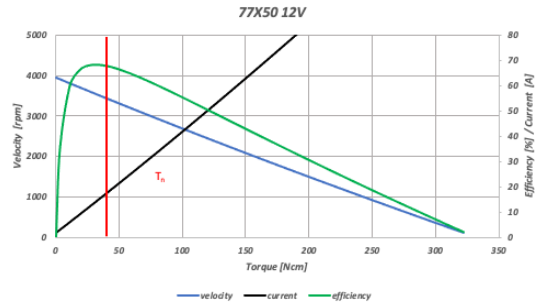
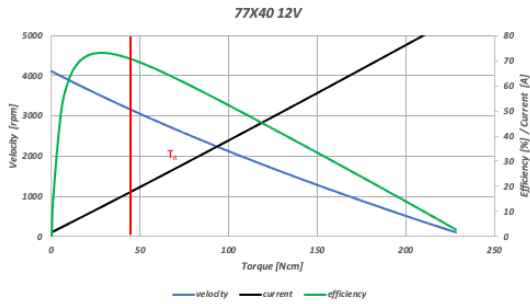
Data		77X40	77X40	77X40	77X50	77X50	77X50
Nominal voltage	VDC	12	24	48	12	24	48
Nominal current	A	16.3	8.0	4.0	15.1	9.4	4.8
Nominal torque	Ncm	40.4	46.5	46.9	34.1	55.1	55.6
Nominal velocity	rpm	3251	2843	2839	3500	2934	2931
Stall torque	Ncm	230	330	330	325	400	405
No load velocity	rpm	4120	3350	3340	3940	3390	3400
Nominal output power	W	138	138	139	125	169	171
Max output power	W	225	279	280	328	362	363
Torque constant	Ncm / A	2.47	5.82	11.67	2.26	5.84	11.68
Rotor inertia	gr cm ²	1500	1500	1500	2000	2000	2000
Weight	Kg	1.68	1.68	1.68	1.92	1.92	1.92

Dimensions in mm



Motor	L
77X40	120.5±0.5
77X50	130.5±0.5

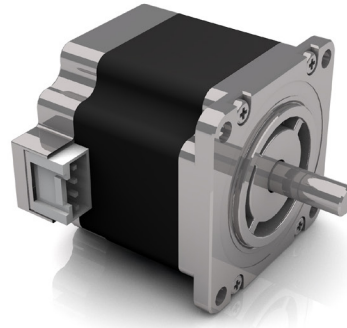
Characteristic diagram





Stepper Motors

>> Series ST



Stepper Motors

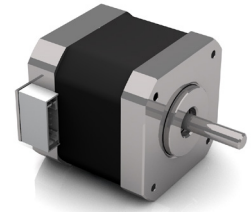
Page 58 ST 17 | 634 017 | Nema 17 Stepper Motor

Page 60 ST 23 | 634 023 | Nema 23 Stepper Motor

Page 62 ST 34 | 634 034 | Nema 34 Stepper Motor

>> ST 17 | 634 017 | Nema 17 Stepper Motor

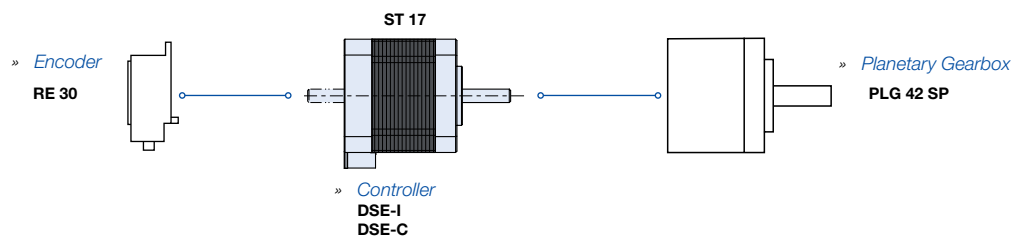
- » 2 Phase Hybrid Stepper
 - » 1.8° step angle (+/-5%)
 - » 42 mm square Nema 17
 - » High grade Neodymium magnets
 - » Customized solutions available on demand
- » Operating temperatures -20°C to +40°C
 - » Sinusoidal back-EMF optimized for microstep operation and high holding torque
 - » Insulation Class 130 (B)



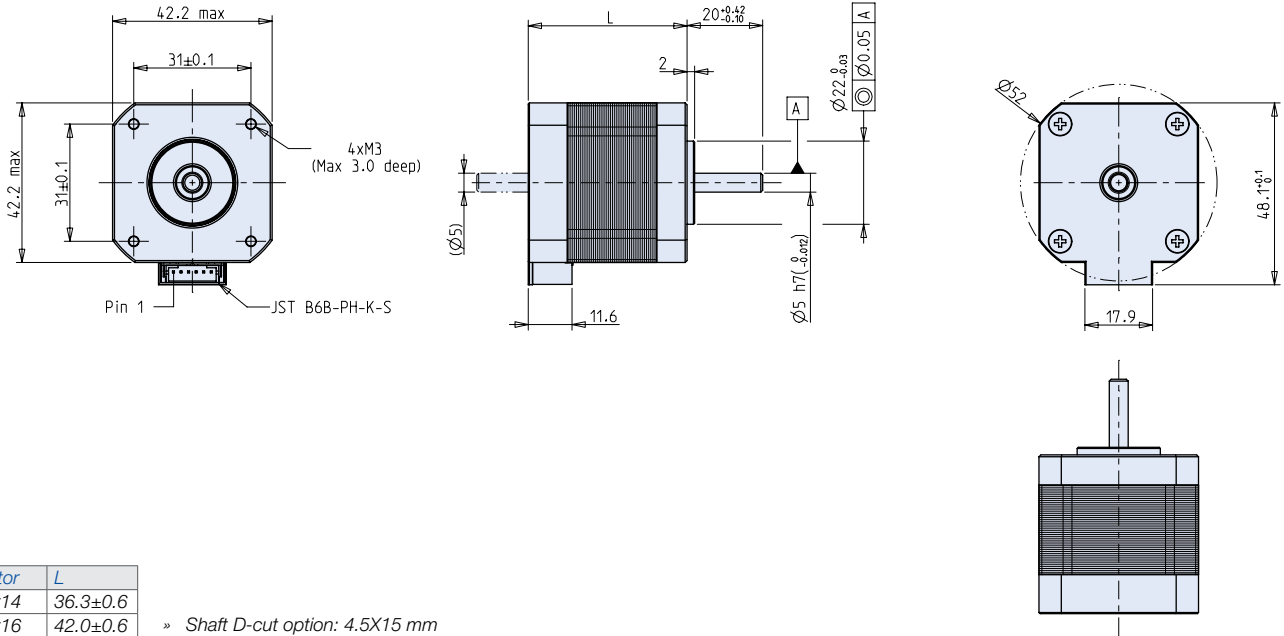
Data		17x14	17x14	17x14	17x16	17x16	17x16	17x20	17x20	17x20
Rated phase current	A	0.40	1.00	1.50	0.40	1.00	2.00	0.40	1.00	2.00
Phase resistance	Ohm	17.90	3.45	1.49	21.21	3.38	0.96	24.88	3.87	1.09
Phase inductance	mH	26.25	4.82	2.02	38.95	6.53	1.69	43.80	7.05	1.64
Holding torque bipolar	Ncm	27	29	28	46	46	46	57	57	57
Detent torque	Ncm	2	2	2	2	2	2	2.5	2.5	2.5
Rotor inertia	gcm ²	40	40	40	57	57	57	83	83	83
Max voltage	VDC	50	50	50	50	50	50	50	50	50
Weight	Kg	0.26	0.26	0.26	0.32	0.32	0.32	0.42	0.42	0.42

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

Modular System



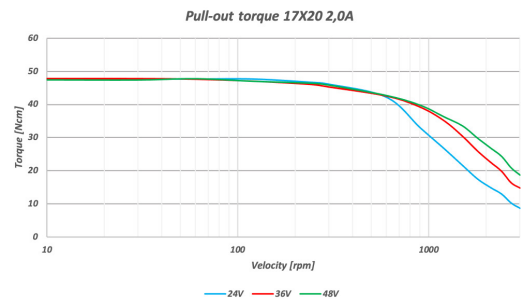
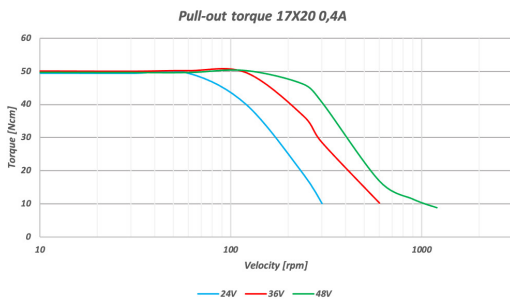
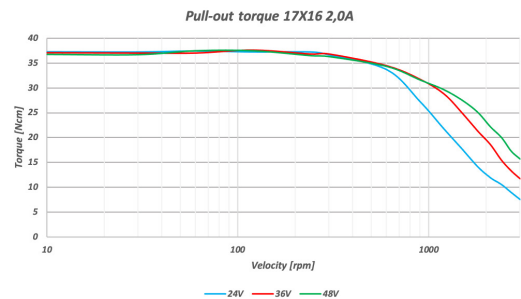
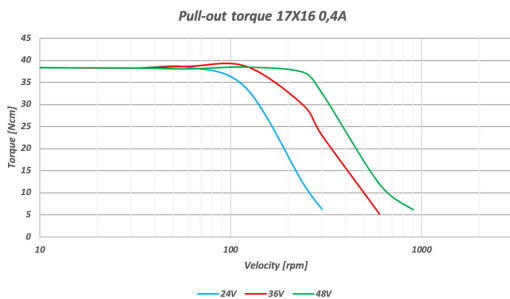
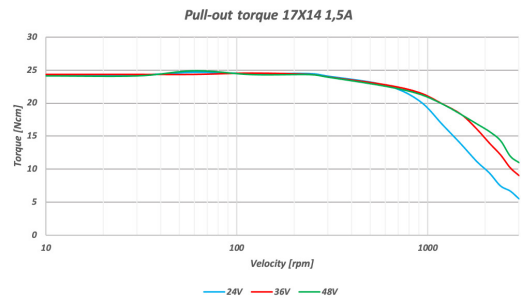
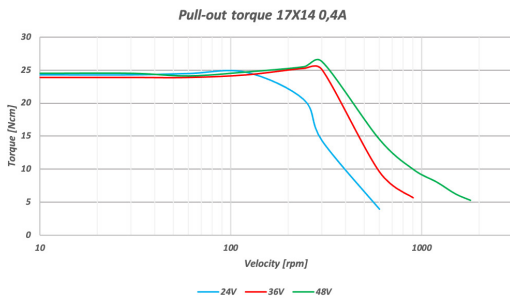
Dimensions in mm



Motor	L	
17x14	36.3±0.6	
17x16	42.0±0.6	» Shaft D-cut option: 4.5X15 mm
17x20	53.0±0.6	» Radial connector available upon request

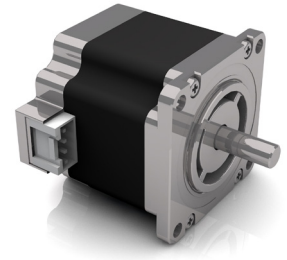
See page 86 for Connector Harness

Characteristic diagram



>> ST 23 | 634 023 | Nema 23 Stepper Motor

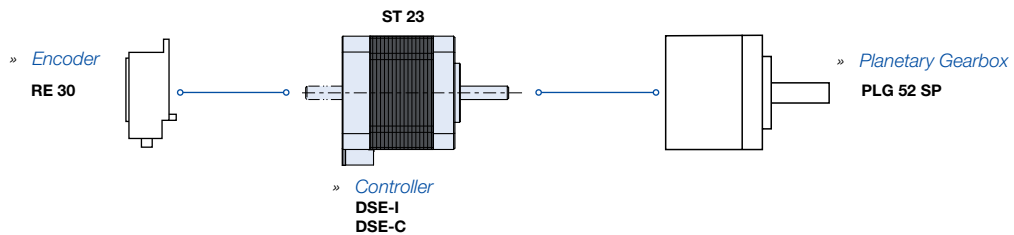
- » 57 mm square Nema 23
- » Hi grade Neodymium magnets
- » 1.8° step angle (+/-5%)
- » customized solutions available on demand
- » Operating temperatures -20°C to +40°C
- » Sinusoidal back-EMF optimized for microstep operation and hi holding torque
- » Insulation Class 130 (B)



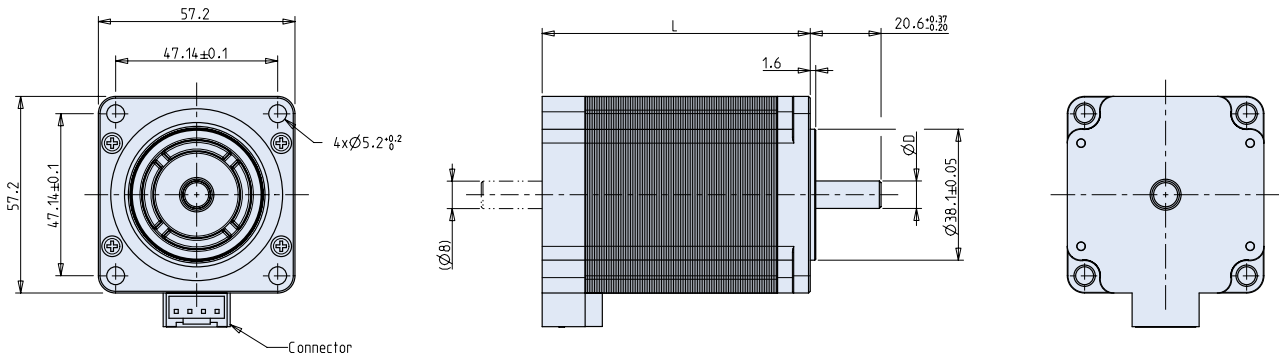
Data		23x16	23x16	23x16	23x21	23x21	23x21	23x31	23x31	23x31	23x31
Rated phase current	A	1	2	3	1	2	3	1	2	3	4
Phase resistance	Ohm	3.67	0.98	0.42	5.14	1.33	0.61	6.26	1.57	0.69	0.43
Phase Inductance	mH	13.51	3.21	1.58	20.75	5.67	2.30	22.35	5.77	2.70	1.66
Holding torque Bipolar	Ncm	70	70	70	140	140	140	200	200	200	210
Detent torque	Ncm	3	3	3	5	5	6	8	7	7	7
Rotor inertia	gcm ²	77	77	77	209	209	209	335	335	335	335
Max voltage	VDC	80	80	80	80	80	80	80	80	80	80
Weight	Kg	0.46	0.46	0.46	0.7	0.7	0.7	1.05	1.05	1.05	1.05

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

Modular System



Dimensions in mm

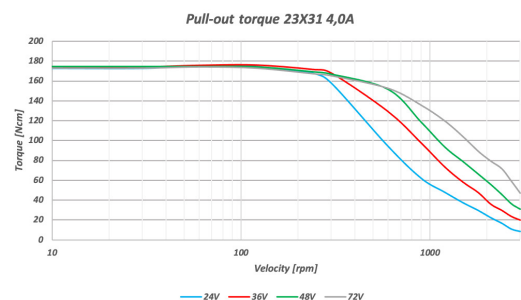
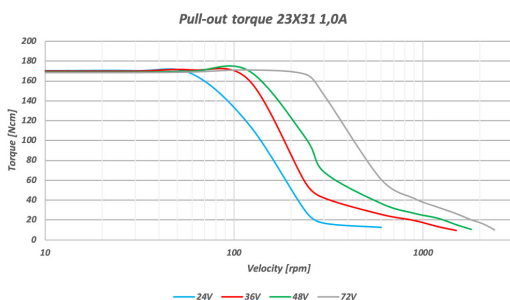
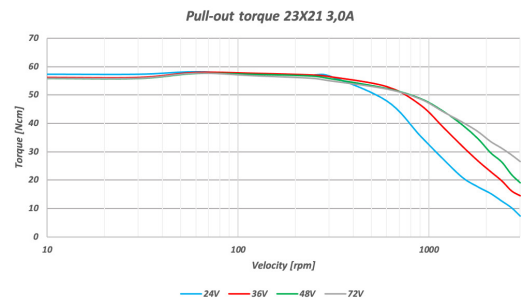
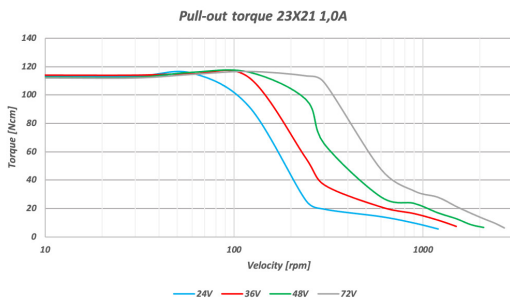
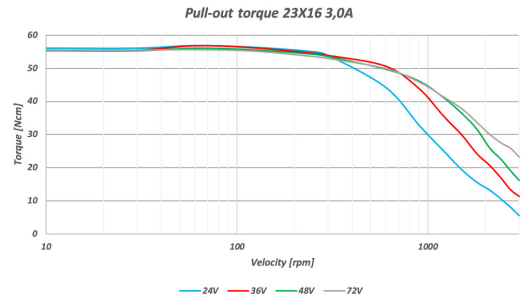
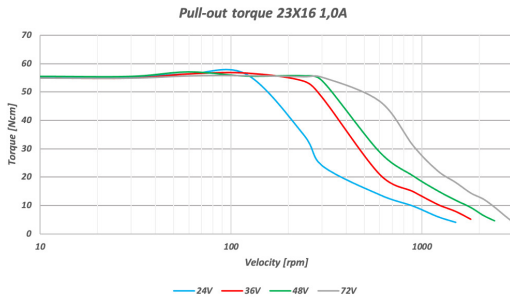


» Shaft D-cut options: 5.8X15 mm or 7.5X15mm

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

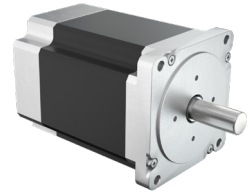
See page 86 for Connector Harness

Characteristic diagram



>> ST 34 | 634 034 | Nema 34 Stepper Motor

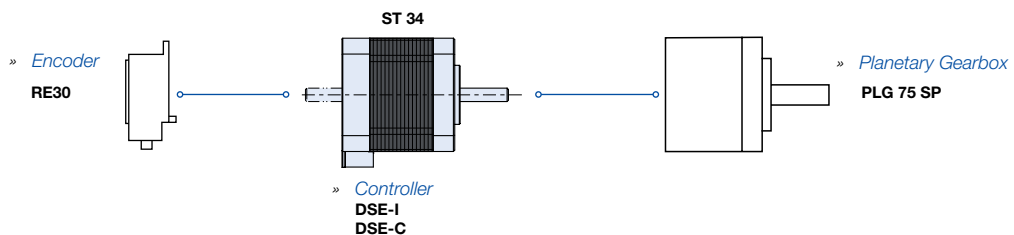
- » 86 mm square Nema 34
- » High grade Neodymium magnets
- » 1.8° step angle (+/-5%)
- » customized solutions available on demand
- » Operating temperatures -20°C to +40°C
- » Sinusoidal back-EMF optimized for microstep operation and hi holding torque
- » Insulation Class 130 (B)



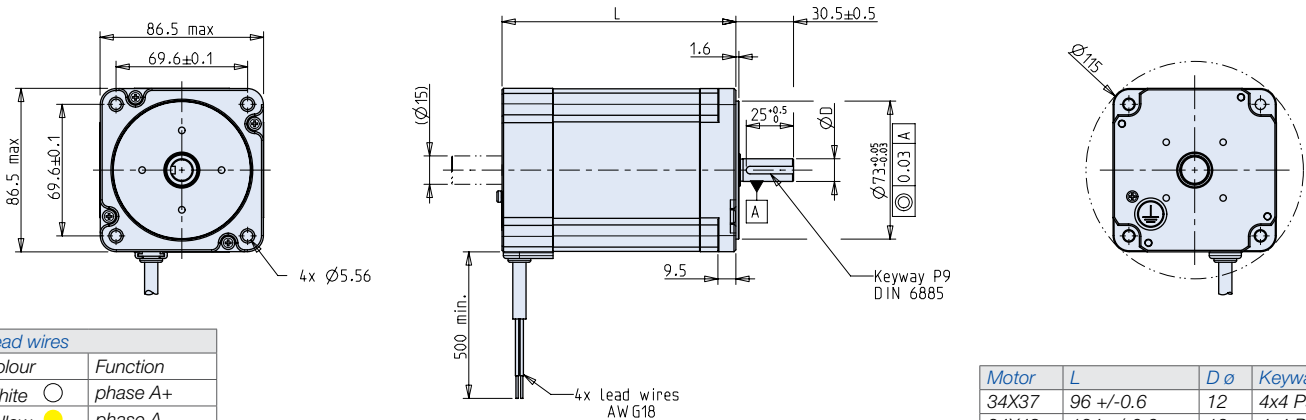
Data		34x37	34x37	34x37	34x48	34x48	34x48	34x55	34x55	34x55	34x62
Rated phase current	A	3.00	5.50	8.00	3.00	5.50	8.00	3.00	5.50	8.00	8.00
Phase resistance	Ohm	1.24	0.42	0.20	1.50	0.46	0.21	1.70	0.55	0.29	0.33
Phase Inductance	mH	12.00	3.60	1.65	12.96	4.00	1.85	20.00	5.60	2.60	3.57
Holding torque Bipolar	Ncm	520	550	550	700	700	700	1000	1000	1000	1200
Detent torque	Ncm	20	20	20	20	20	20	30	30	30	35
Rotor inertia	gcm ²	3460	3460	3460	3870	3870	3870	4900	4900	4900	8269
Max voltage	VDC	160	160	160	160	160	160	160	160	160	160
Weight	Kg	3.00	3.00	3.00	4.00	4.00	4.00	4.60	4.60	4.60	5.40

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

Modular System



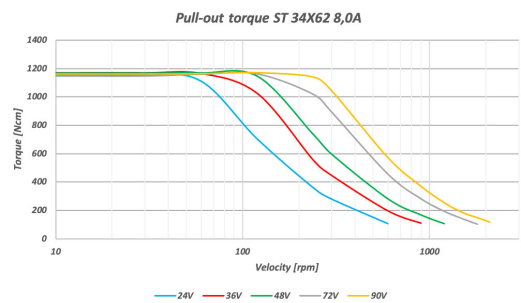
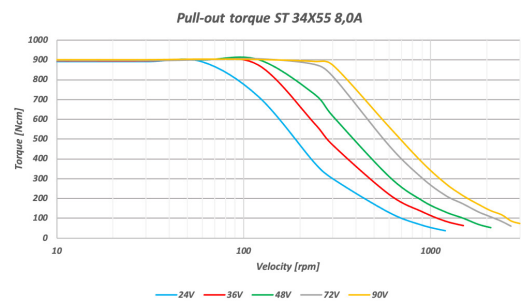
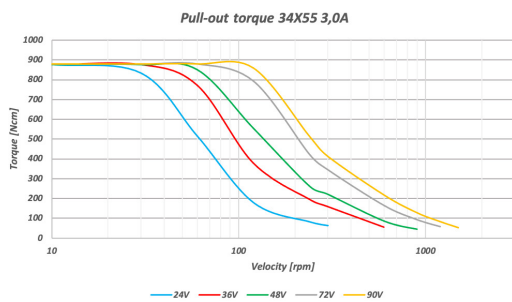
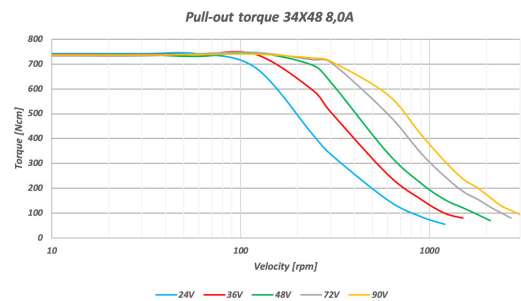
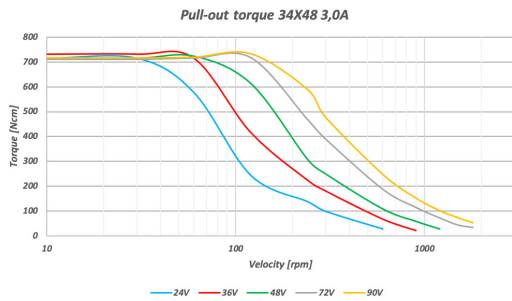
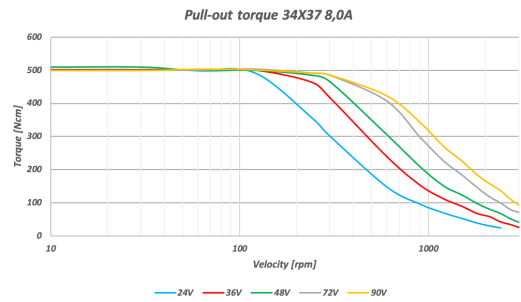
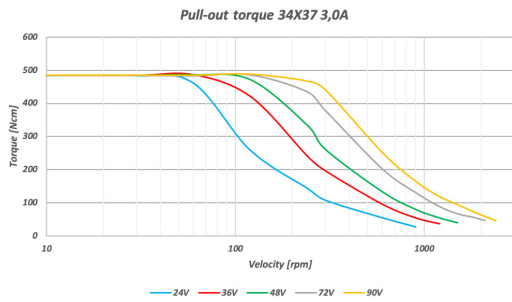
Dimensions in mm



Lead wires	
Colour	Function
White	○ phase A+
Yellow	● phase A-
Red	● phase B+
Blue	● phase B-

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





Brushless AC/DC Motors

>> Series BL



Brushless AC/DC Motors

Page 66	BL 42 632 042 Brushless Motor 42mm
Page 68	BL 57 632 057 Brushless Motor 57 mm 4 Pole
Page 70	BL 57 632 057 Brushless Motor 57 mm 8 Pole

>> BL 42 | 632 042 | Brushless Motor 42mm

- » 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

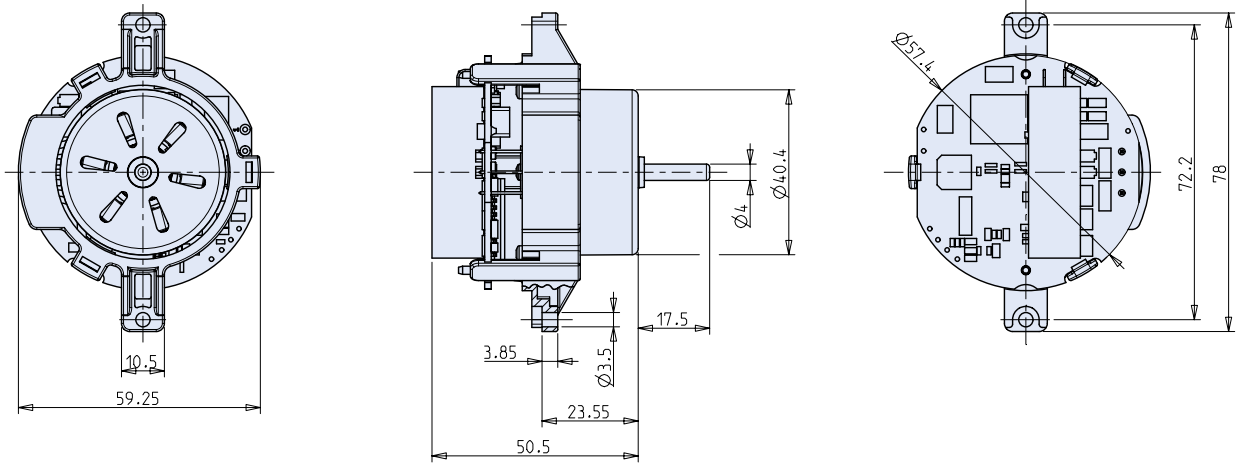


Data		230V
Nominal voltage	VAC	230
Nominal current	Arms	1.3
Nominal torque	Ncm	4
Nominal velocity	rpm	28500
No load velocity	rpm	36000
Nominal input power	W	147
Nominal output power	W	119
Rotor inertia	gcm ²	71.5
Weight	g	144

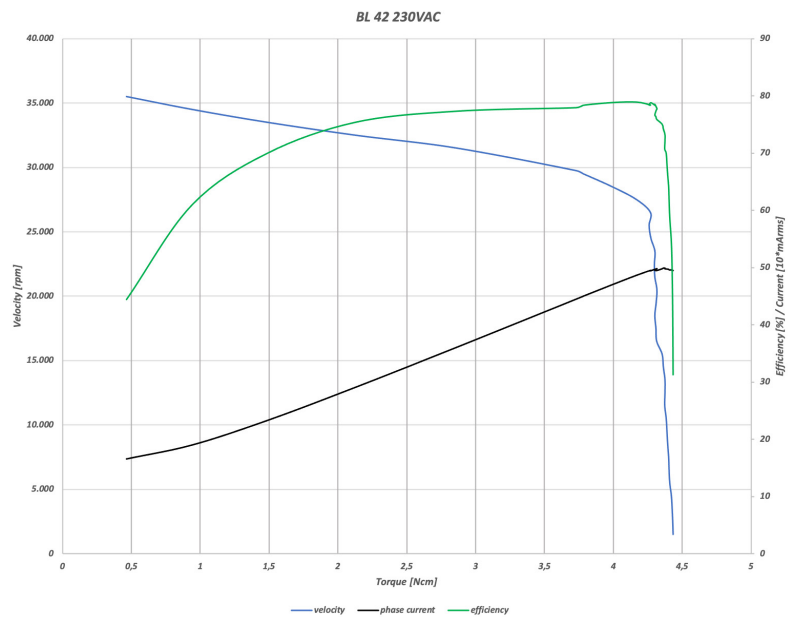
Options:

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

Dimensions in mm



Characteristic diagram



>> BL 57 | 632 057 | Brushless Motor 57mm 4 Pole

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

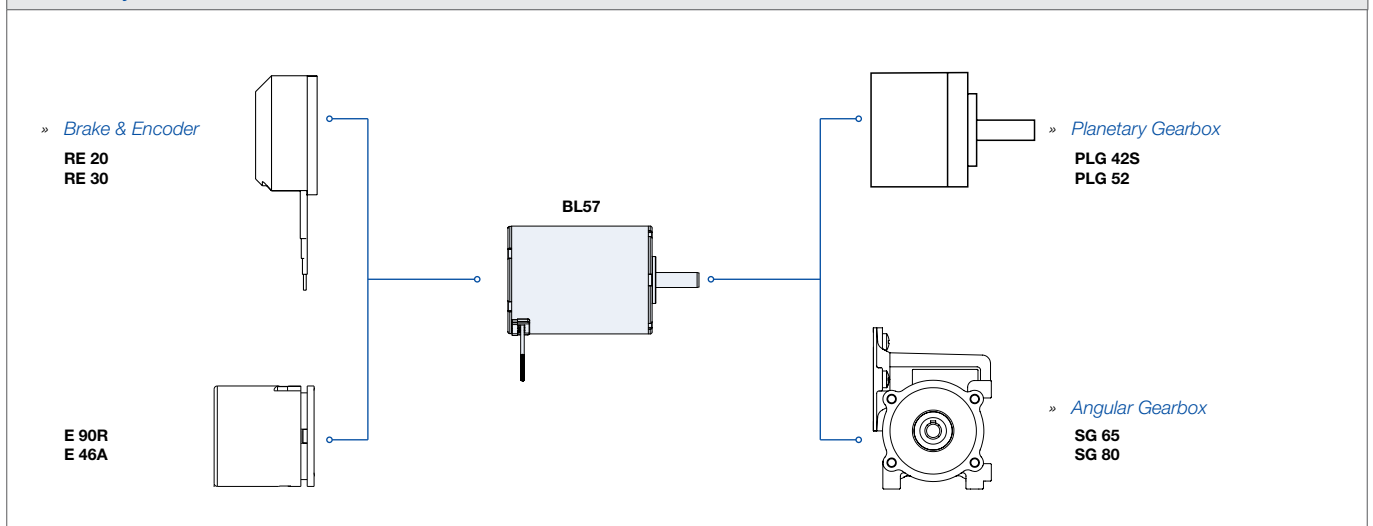
- » High power neodymium magnets
- » Low noise level
- » Low cogging torque
- » Customized solutions available on demand



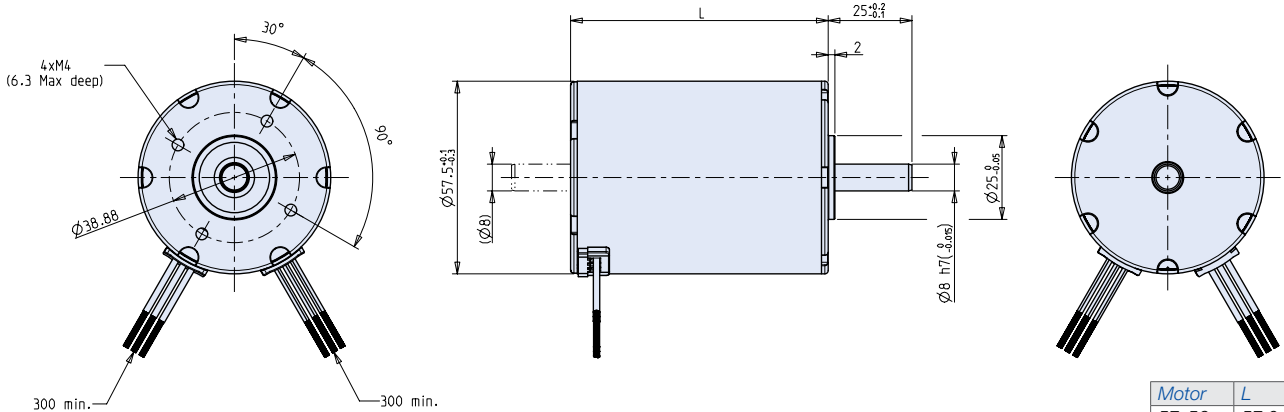
Data		57x56		57x76		57x96	
Nominal voltage	VDC	24	40	24	40	24	40
Nominal phase current	Arms	2.73	1.73	4.76	3.43	7.31	5.20
Nominal torque	Ncm	11	11	22	25	35	35
Nominal velocity	rpm	4018	4120	3850	4150	3900	4180
Stall torque	Ncm	50	45	90	110	150	150
No load velocity	rpm	5350	5400	5320	5380	5050	5380
Nominal 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 ²	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

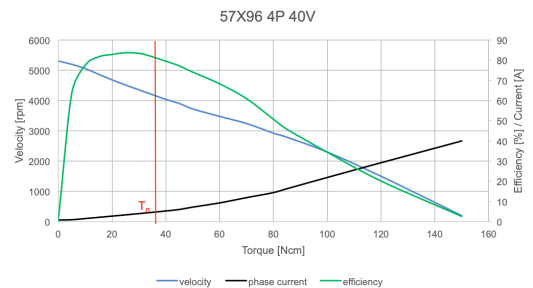
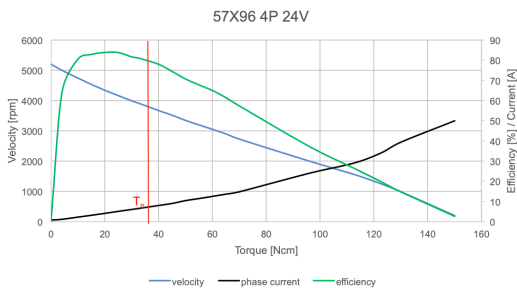
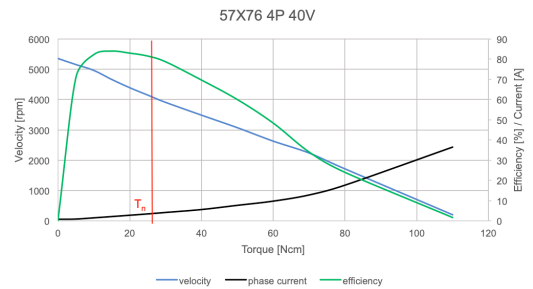
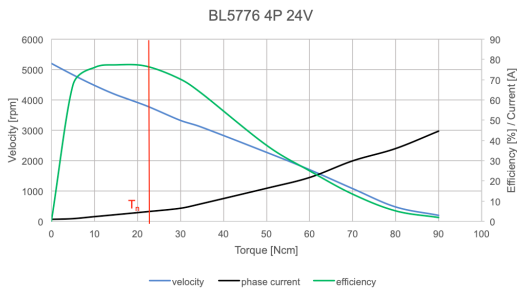
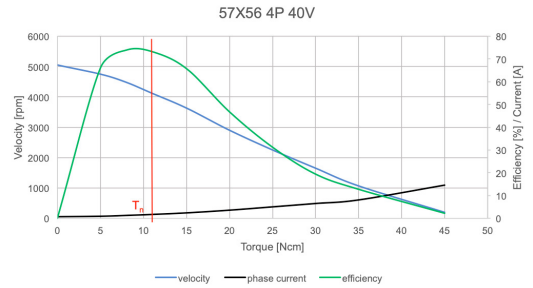
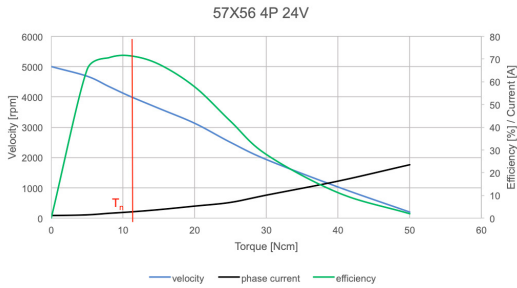


Motor	L
57x56	57.0±0.2
57x76	77.0±0.2
57x96	97.0±0.2

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



>> BL 57 | 632 057 | Brushless Motor 57mm 8 Pole

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

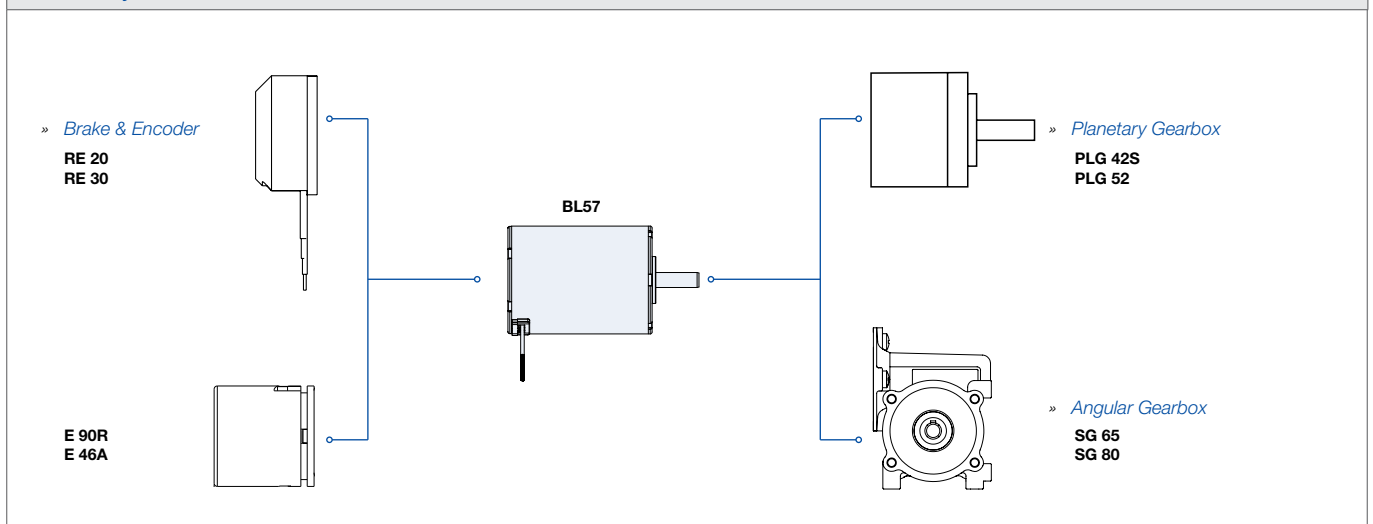
- » High power neodymium magnets
- » Low noise level
- » Low cogging torque
- » Customized solutions available on demand



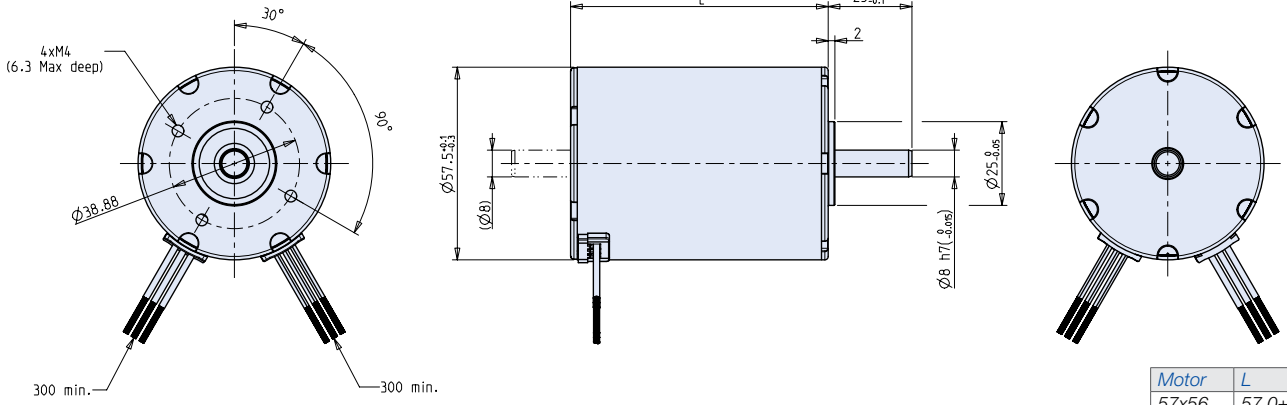
Data		57x56		57x76		57x96	
Nominal voltage	VDC	24	40	24	40	24	40
Nominal phase current	Arms	3.15	2.32	5.13	3.06	7.20	4.68
Nominal torque	Ncm	11	11	22	22	33	33
Nominal velocity	rpm	2850	3005	3315	3324	3160	3200
Stall torque	Ncm	48	38	125	105	130	110
No load velocity	rpm	4950	4900	5050	5100	5060	5182
Nominal 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 ²	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

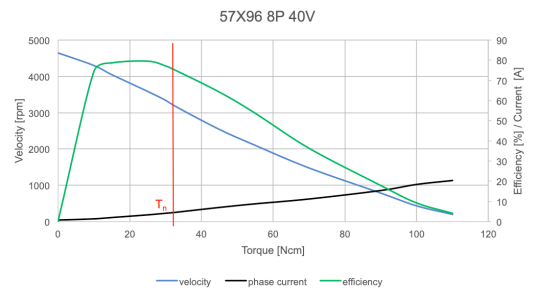
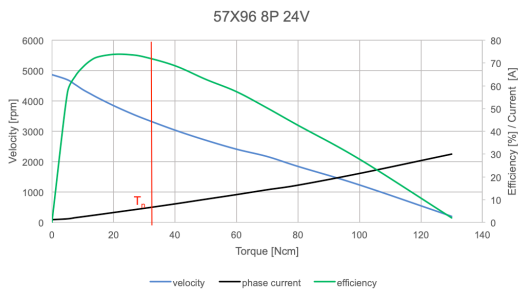
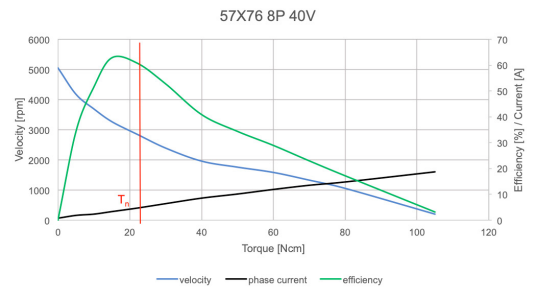
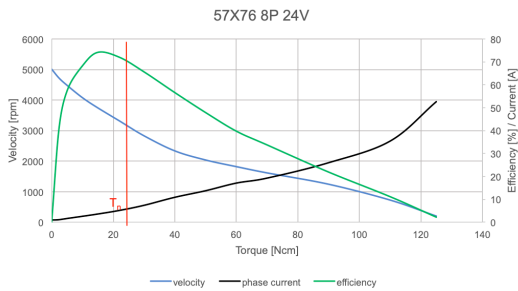
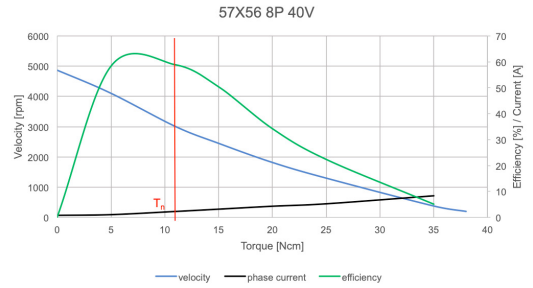
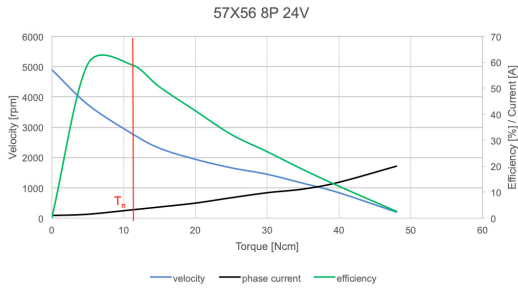


Motor	L
57x56	57.0±0.2
57x76	77.0±0.2
57x96	97.0±0.2

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

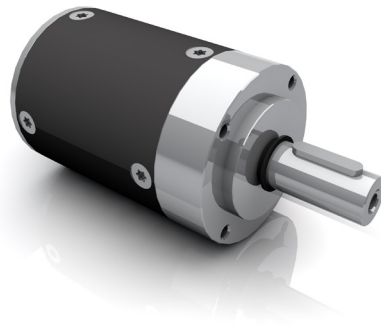
Pin Assignment		
Colour		Function
Red	●	Vcc
Black	●	GND
Green	●	Hall A
Blue	●	Hall B
White	○	Hall C

Characteristic diagram





Accessories



Gearboxes, Encoders, Brakes, Controllers, Accessories

Page 74 Gearboxes

Page 81 Incremental Encoders

Page 82 Brakes

Page 84 Controllers

Page 86 Accessories

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



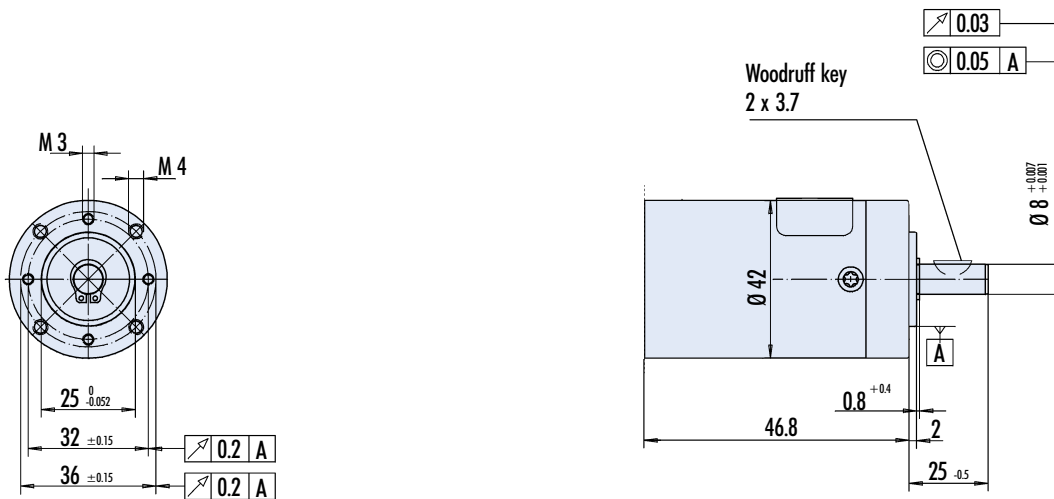
Lifetime lubrication	Food grade lubrication	Low temperature	High efficiency	High torque	Special surface available	Protection class (up to)

Data | PLG 42 SP - Ring gear made of steel

Reduction ratio	-	4	6.25
Efficiency	%	90	
Number of stages	-	1	
Continuous torque	Nm	3.5	
Weight of gearbox	kg	0.27	
Axial load / radial load (middle of key)	N	150 / 250	

Preference On request

Dimensions in mm



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



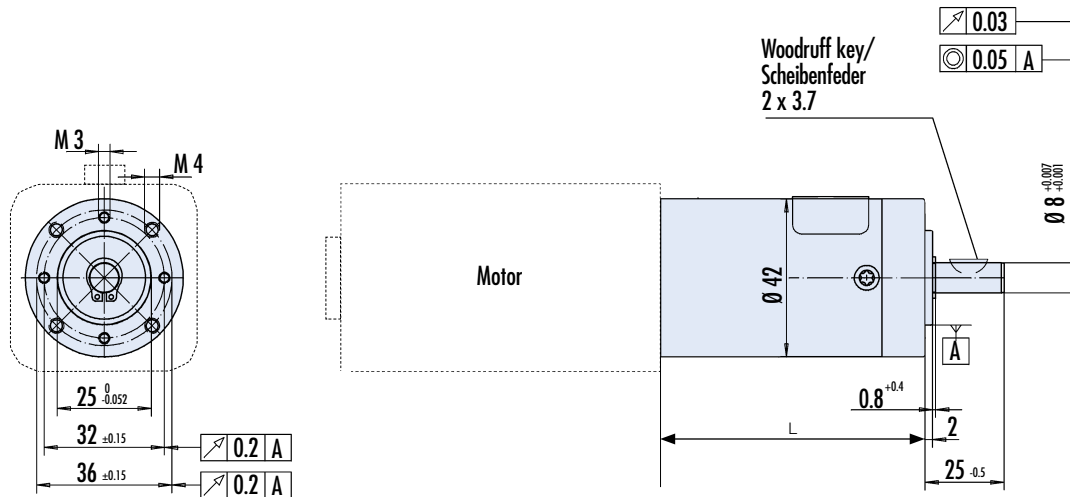
Lifetime lubrication	Food grade lubrication	Low temperature	High efficiency	High torque	Special surface available	Protection class (up to)

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								

Preference On request

Dimensions in mm










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

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

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

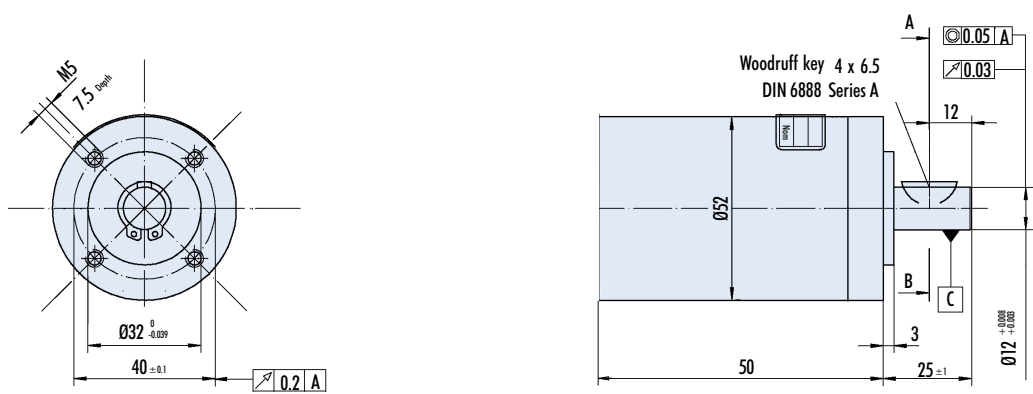


						
Lifetime lubrication	Food grade lubrication	Low temperature	High efficiency	High torque	Special surface available	Protection class (up to)

Data PLG 52 SP - Ring gear steel or plastic				
Reduction ratio	-	3.33	4.5	6.25
Efficiency	%		90	
Number of stages			1	
Continuous torque	Nm		8	
Weight of gearbox	kg		0.56	
Axial load / radial load (middle of key)	N		500 / 350	

Preference On request

Dimensions in mm



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



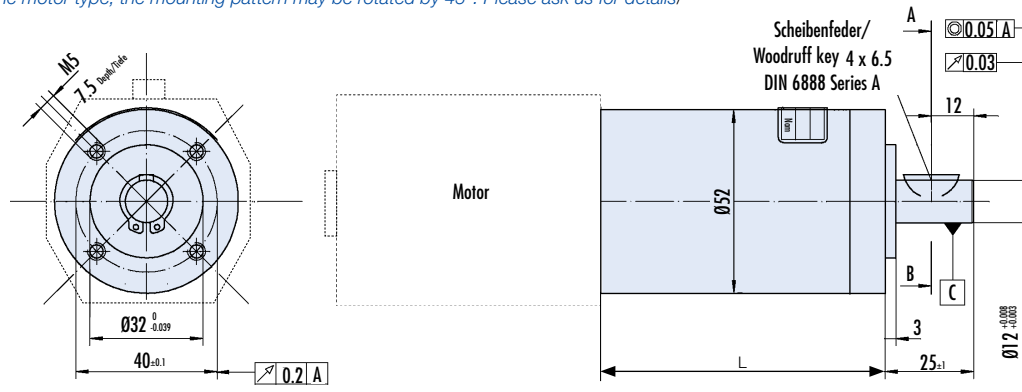
Lifetime lubrication	Food grade lubrication	Low temperature	High efficiency	High torque	Special surface available	Protection class (up to)

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

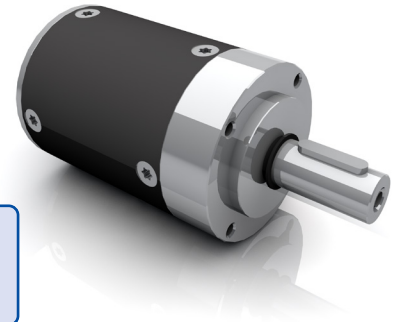
Depending on the motor type, the mounting pattern may be rotated by 45°. Please ask us for details/










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

>> PLG 75 SP

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



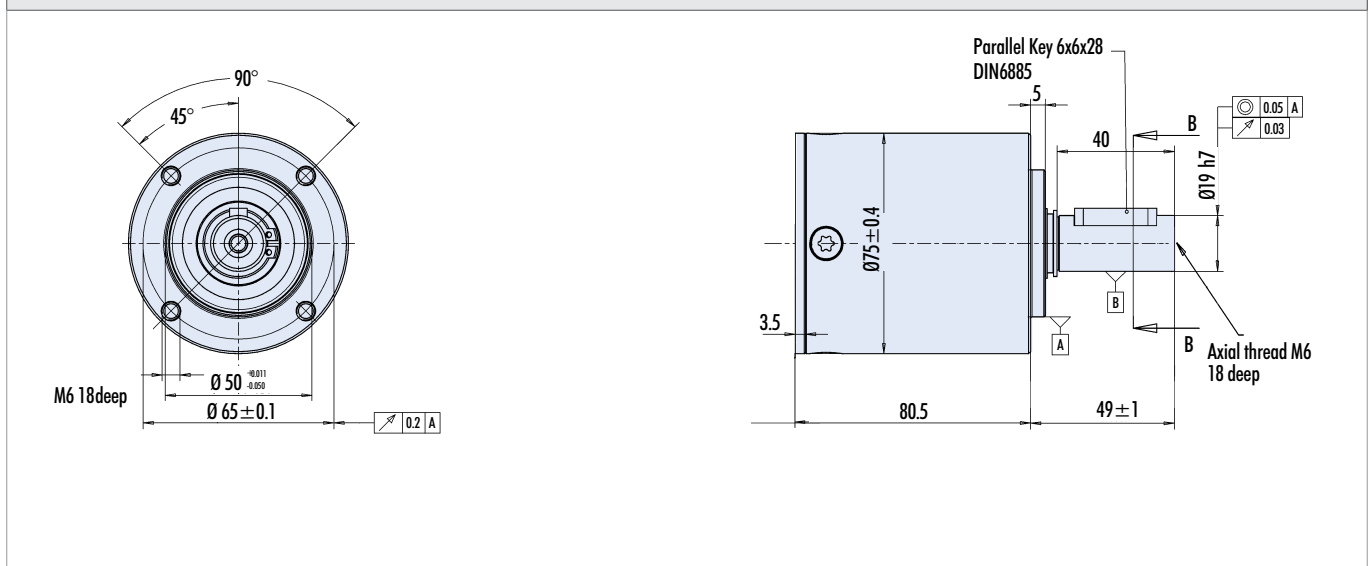
						
Low noise	Lifetime lubrication	Food grade lubrication	Low temperature	High efficiency	Special surface available	Protection class (up to)

Data | PLG 75 SP - Ring gear made of steel

Reduction ratio	-	4.2	5.0	7.0
Efficiency	%	90		
Number of stages	-	1		
Continuous torque	Nm	44	52	50
Operating mode	-	S1 / S8		
Weight of gearbox	kg	1.7		
Axial load/ radial load (middle of key)	N	1000 / 1000		

 Preference  On request

Dimensions in mm



- » 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



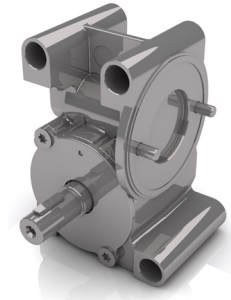
Low noise



Lifetime lubrication



Low temperature



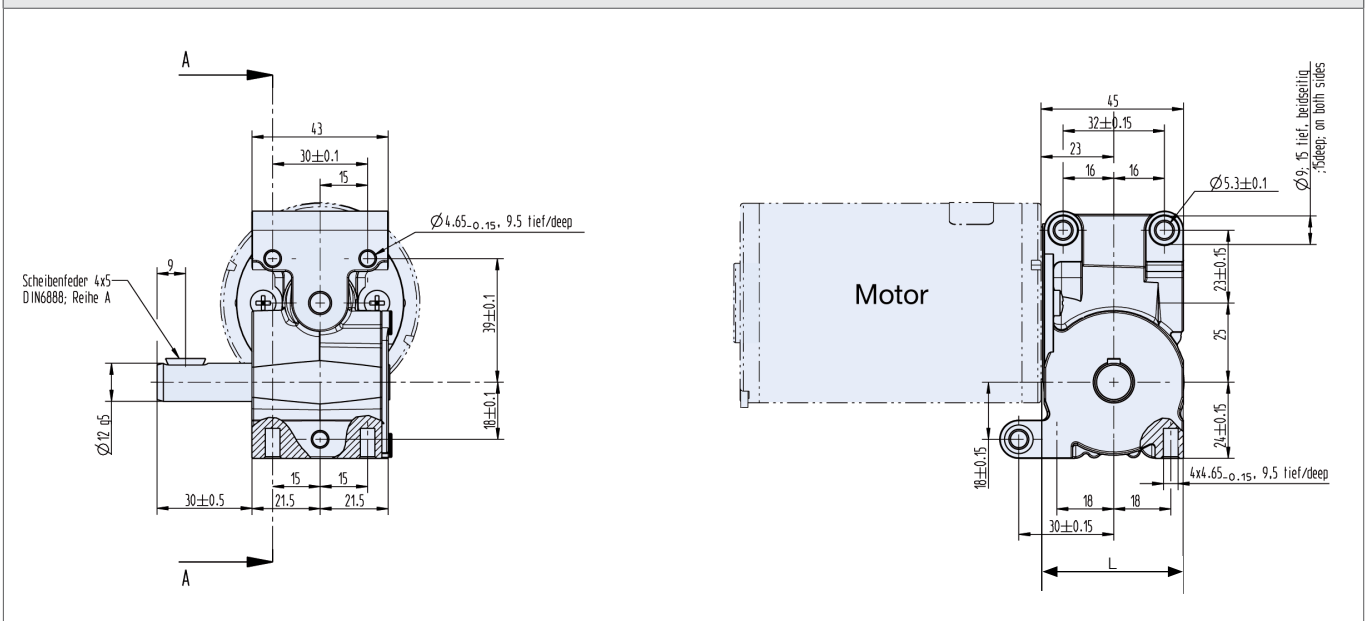
Data | SG 65

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

Preference

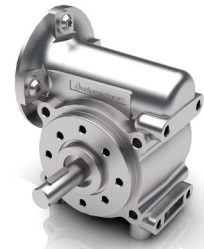
On request

Dimensions in mm



>> SG 80 | SG 80 H | SG 80 K

- » 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)

Data/ Technische Daten | SG 80 | SG 80 H | SG 80 K

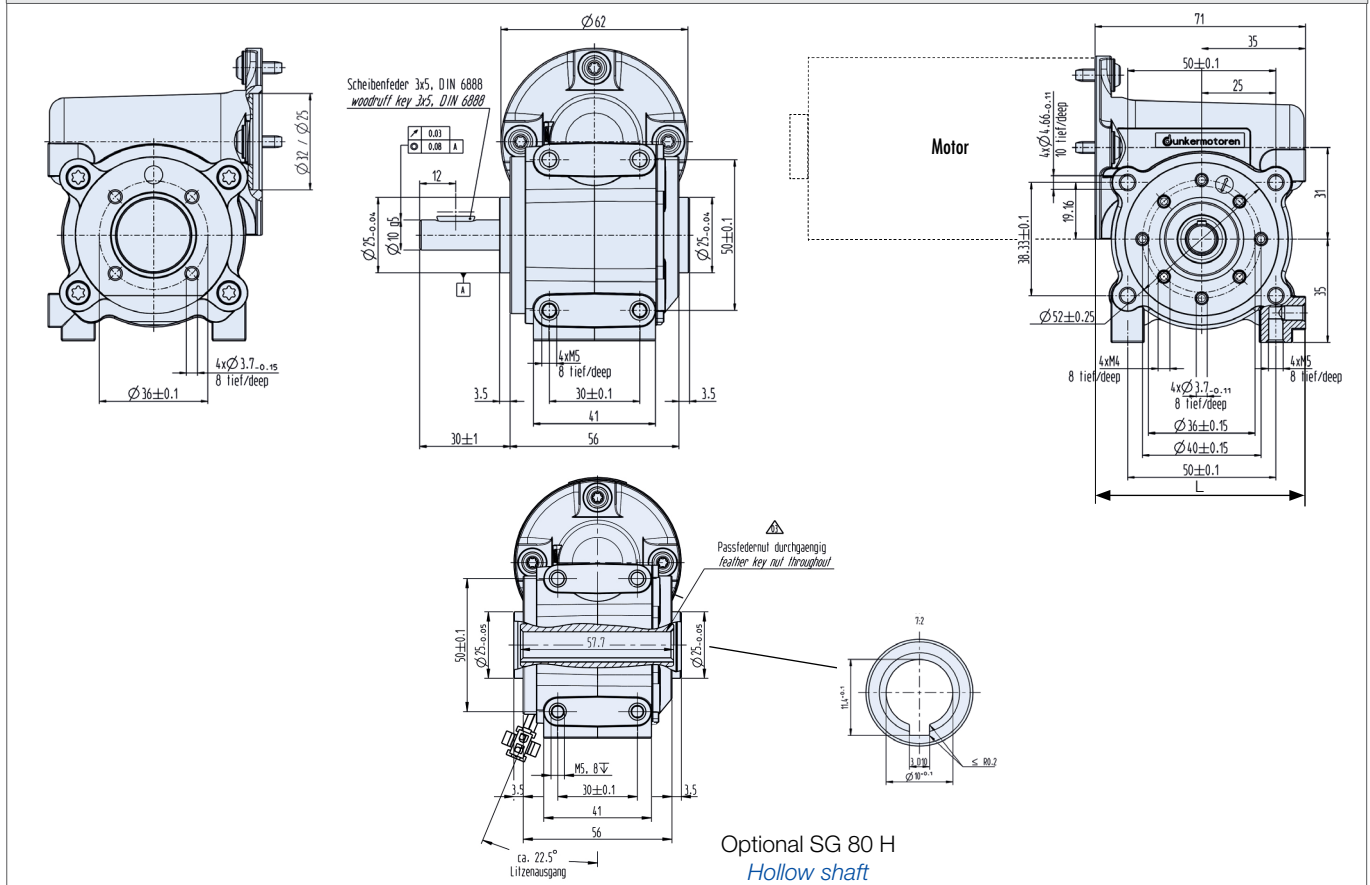
Reduction ratio	SG 80 / SG 80 H	5	10	15	24	38	50	75
Efficiency	%	70	65	55	50	40	35	25
Continuous torque	Nm	2	2.5	3.5	3.5	3.5	4	4
Max. acceleration torque	Nm	8						
Emergency torque	Nm	12						
Operating mode	-	S1 / S8 *						
Reduction ratio	SG 80 K	7	10	15	24.5	-	-	-
Efficiency	%	82	80	70	65	-	-	-
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						

Preference

On request

* 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

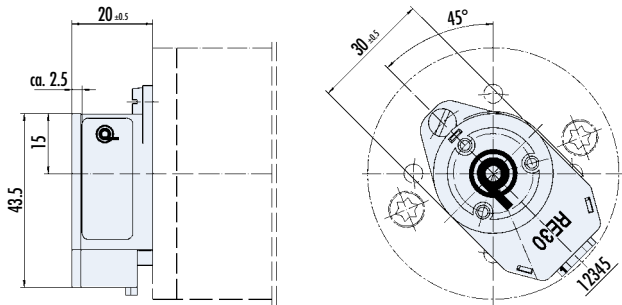
motors or with protective hoods in protection class IP54 or higher. In combination with the brushless motors, the incremental encoders can also be integrated in the profile housing of the motor in protection class IP 65.

Data/ Technische Daten		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	100 / 500	100 / 500	100 / 500	100 / 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 ¹	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

Preference

On request

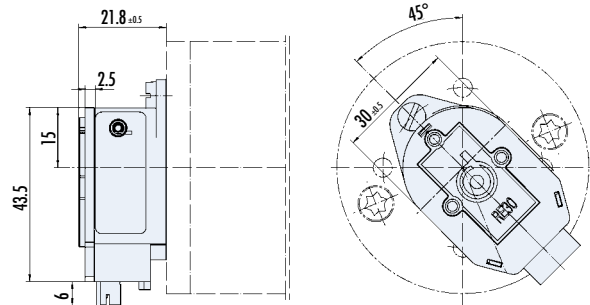
RE 30 (without cover) IP 30



Suitable connector with 500 mm strand

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

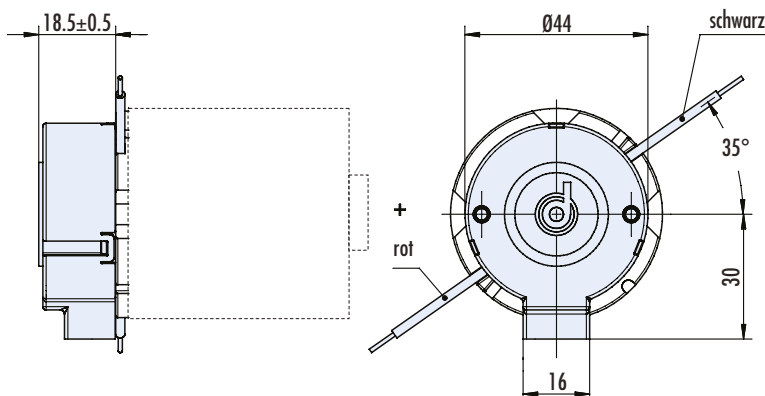
RE 30 TI (without cover) IP 30



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



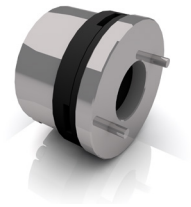
Pin	RE 20
1	GND 0V
2	-
3	A
4	Vcc 5V
5	B

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.



E 46 A

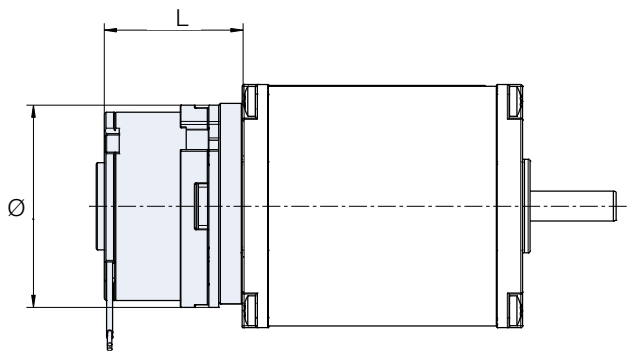


E 90 R

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

* Values valid in run-in condition

Brakes IP 20



Brakes are not in extruded body

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

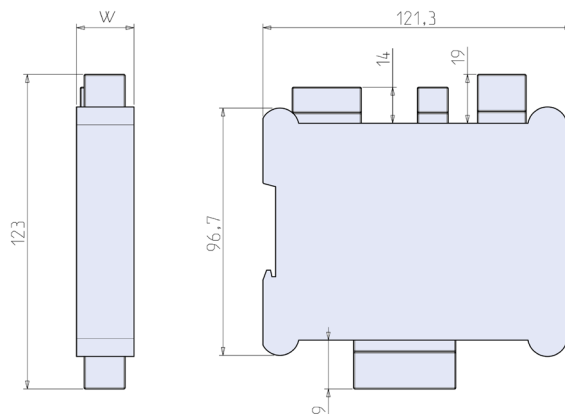
» DSE-I Stepper Motor Controller

- » Very compact Stepper Motor Controller with vector control and closed loop operations
- » Speed, torque and position control
- » 1 analogue input, 8 digital input, 3 digital output
- » Different voltage and current ratings available
- » Cooler operation: current proportional to the load
- » Deploy and diagnostic software on request



Data		I/O Controller	
		DSE-I 45 SE	DSE-I 100 SE
Power Supply Voltage	Vdc	24 ... 90	24 ... 90
Phase Current	Arms	1 ... 4.5	2 ... 10
Analogue Input Voltage	Vdc	-10 ... +10	-10 ... +10
Digital Input Voltage	Vdc	3 ... 28	3 ... 28
Digital Output Voltage	Vdc	0 ... 30	0 ... 30
Digital Output Current	mA	80	80
Protection Class	IP	20	20
Ambient Temperature	°C	-10 ... +40	-10 ... +40
Relative Humidity	%	5 ... 90	5 ... 90
Weight	Kg	0.20	0.24
Width (W)	mm	22.5	35.5

Dimensions in mm



Pin Assignment

CN1.1	+Vp	Power supply ground	CN3.14	DO1-	Digital output 1-
CN1.2	GND	Ground	CN3.15	AIN0+	Analogue input 0
CN2.1	Ma-	Motor phase A-	CN3.16	AIN0 GND	Analogue input 0 ground
CN2.2	Ma+	Motor phase A+	CN3.17	DO2+	Digital output 2+
CN2.3	Mb+	Motor phase B+	CN3.18	DO2-	Digital output 2-
CN2.4	Mb-	Motor phase B-	CN3.19	DI567COM	DI5 ... DI7 (Common)
CN2.5	Shield	Shield	CN3.20	DI5	Digital input 5
CN3.1	+24 V	Auxiliary supply voltage	CN3.21	DI6	Digital input 6
CN3.2	GND	Auxiliary supply ground	CN3.22	DI7	Digital input 7
CN3.3	DI0+	Digital input 0+	CN4.1	+Ve	Power supply
CN3.4	DI0-	Digital input 0-	CN4.2	GND	Encoder ground
CN3.5	DI1+	Digital input 1+	CN4.3	A	Encoder channel A
CN3.6	DI1-	Digital input 1-	CN4.4	/A	Encoder channel /A
CN3.7	DI234COM	DI2 ... DI4 (Common)	CN4.5	B	Encoder channel B
CN3.8	DI2	Digital input 2	CN4.6	/B	Encoder channel /B
CN3.9	DI3	Digital input 3	CN4.7	I	Encoder index
CN3.10	DI4	Digital input 4	CN4.8	/I	Encoder index neg
CN3.11	DO0+	Digital output 0+	CN4.9	-	Not assigned
CN3.12	DO0-	Digital output 0-	CN4.10	-	Not assigned
CN3.13	DO1+	Digital output 1+			

➤ DSE-C Stepper Motor Controller

CANopen

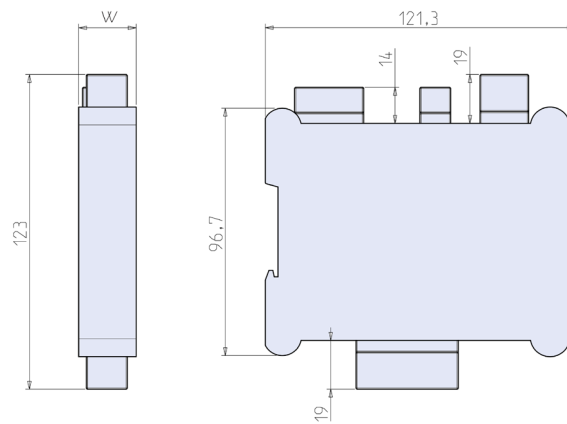


MNE®

- » Very compact Stepper Motor Controller with vector control and closed loop operations
- » Homing mode, speed, torque and position control
- » 2 analogue input, 2 analogue output, 6 digital input, 3 digital output
- » Different voltage and current ratings available
- » Cooler operation: current proportional to the load
- » Node-ID and baud rate settable by DIP-Switch

Data		CANopen Controller (DS402, DS301)	
		DSE-C 45 SE	DSE-C 100 SE
Power Supply Voltage	Vdc	24 ... 90	24 ... 90
Phase Current	Arms	1... 4.5	2 ... 10
Analogue Input Voltage	Vdc	-10 ... +10	-10 ... +10
Digital Input Voltage	Vdc	3 ... 28	3 ... 28
Analogue Output Voltage	Vdc	0 ... 10	0 ... 10
Digital Output Voltage	Vdc	0 ... 30	0 ... 30
Digital Output Current	mA	80	80
Protection Class	IP	20	20
Ambient Temperature	°C	-10 ... +40	-10 ... +40
Relative Humidity	%	5 ... 90	5 ... 90
Weight	Kg	0.21	0.25
Width (W)	mm	22.5	35.5

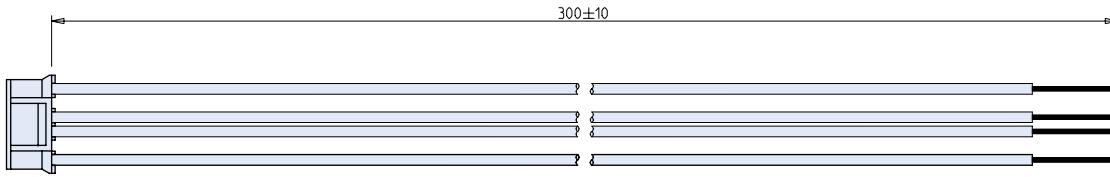
Dimensions in mm



Pin Assignment					
CN1.1	+Vp	Power Supply Voltage	CN3.14	DO1-	Digital output 1-
CN1.2	GND	Power supply ground	CN3.15	DO2+	Digital output 2+
CN2.1	Ma-	Motor phase A-	CN3.16	DO2-	Digital output 2-
CN2.2	Ma+	Motor phase A+	CN4.1	+Ve	Encoder supply
CN2.3	Mb+	Motor phase B+	CN4.2	GND	Encoder ground
CN2.4	Mb-	Motor phase B-	CN4.3	A	Encoder channel A
CN2.5	Shield	Shield	CN4.4	/A	Encoder channel /A
CN3.1	+24 V	Auxiliary supply voltage	CN4.5	B	Encoder channel B
CN3.2	GND	Auxiliary supply ground	CN4.6	/B	Encoder channel /B
CN3.3	DI567COM	DI5 ... DI7 (Common)	CN4.7	I	Encoder index
CN3.4	DI234COM	DI2 ... DI4 (Common)	CN4.8	/I	Encoder index neg
CN3.5	DI5	Digital input 5	CN4.9	-	Not assigned
CN3.6	DI2	Digital input 2	CN4.10	-	Not assigned
CN3.7	DI6	Digital input 6	CN5.1	AO0	Analogue output 0
CN3.8	DI3	Digital input 3	CN5.2	AI0	Analogue input 0
CN3.9	DI7	Digital input 7	CN5.3	AO1	Analogue output 1
CN3.10	DI4	Digital input 4	CN5.4	AI1	Analogue input 1
CN3.11	DO0+	Digital output 0+	CN5.5	GND	Analogue ground
CN3.12	DO0-	Digital output 0-	CN5.6	GND	Analogue ground
CN3.13	DO1+	Digital output 1+			

Connector with cable for ST 17 634 017

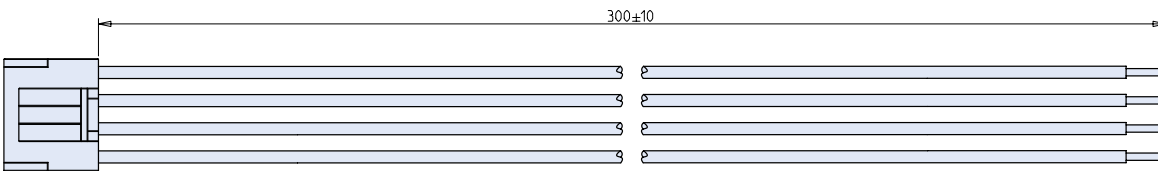
» Connector: JST PHR-6 » Terminal: JST SPH-002T-PO5L » Leads: AWG26 UL1569



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

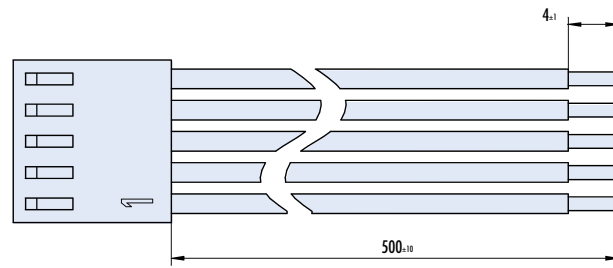
» Connector: JST VHR-4N » Terminal: JST SVH-21T-P1.1 » Leads: AWG22 UL1569



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

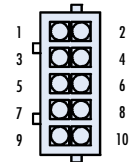
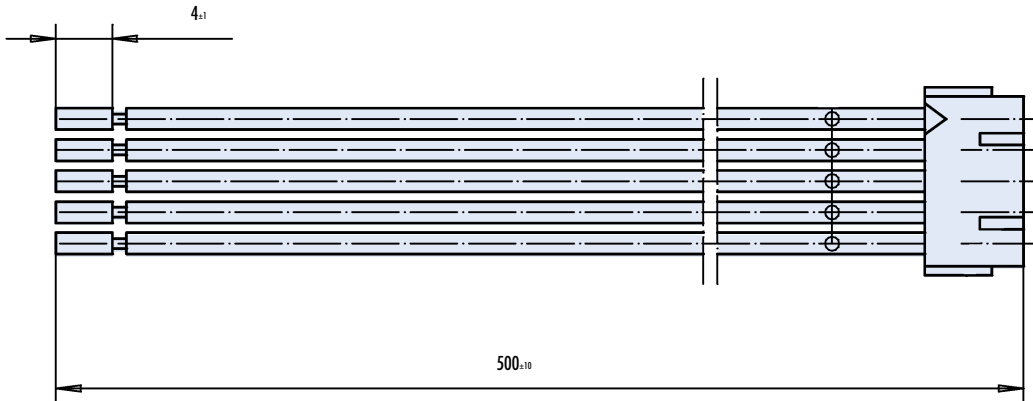
Connector: Molex, 5-pin Type 5051-M



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

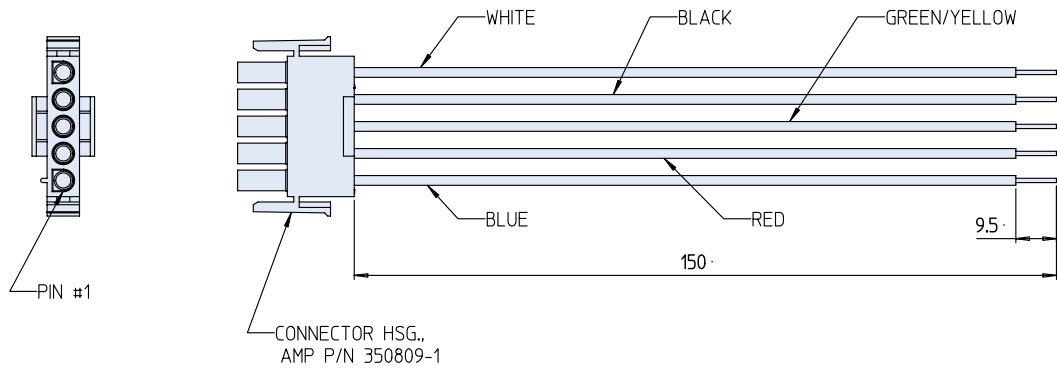
Connector with cable for encoder RE .. TI

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

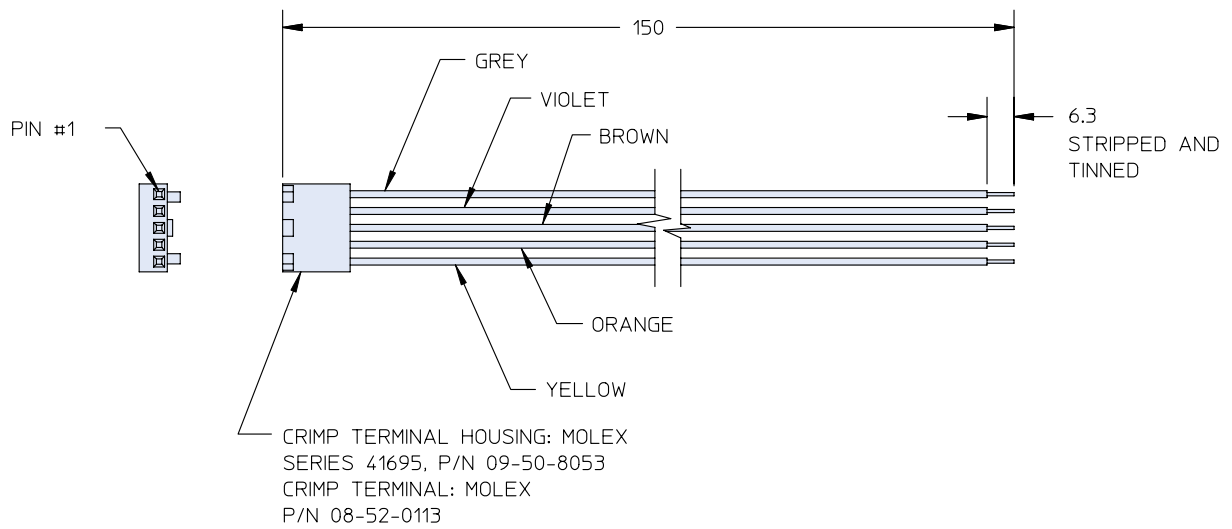


Pin	Color
1	-
2	red
3	black
4	-
5	grey
6	yellow
7	white
8	green
9	pink
10	brown

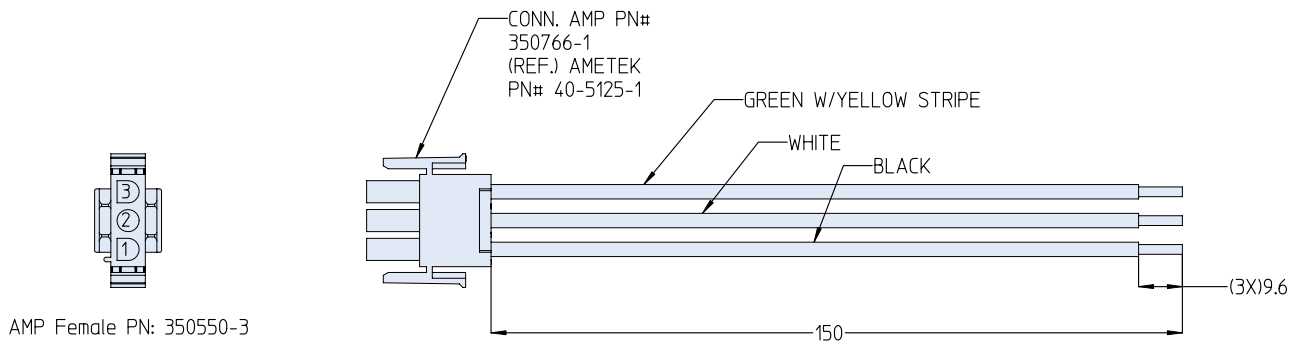
PN 5230002512 Power Harness for BB 89 145 mm 621 089 AC



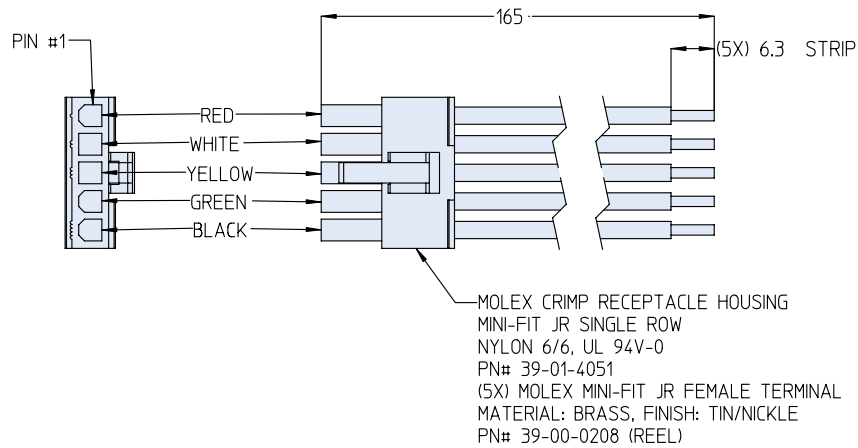
PN 5230002657 Option Card Harness for BB 89 145 mm 621 089 AC



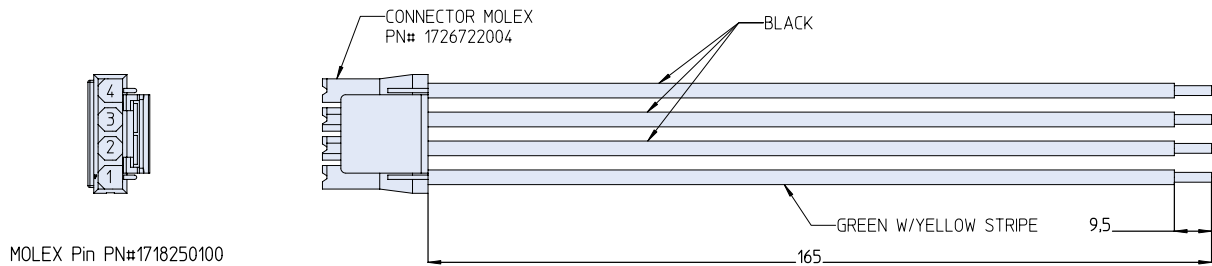
PN 5230002658 Power Harness for BB 158 312 mm 612158 120V 1Ph



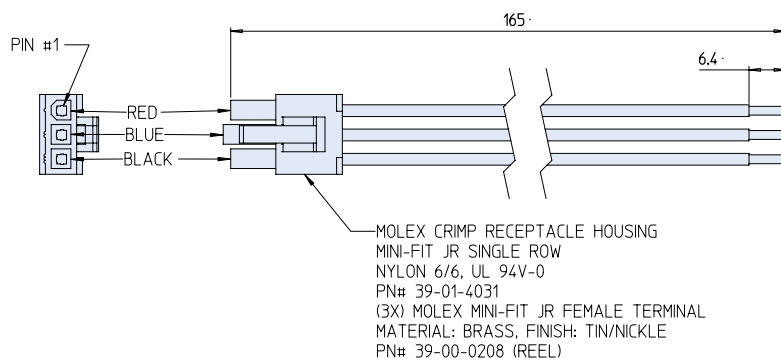
PN 5230002542 Control Harness for BB 158 312 mm 612158 120V 1Ph



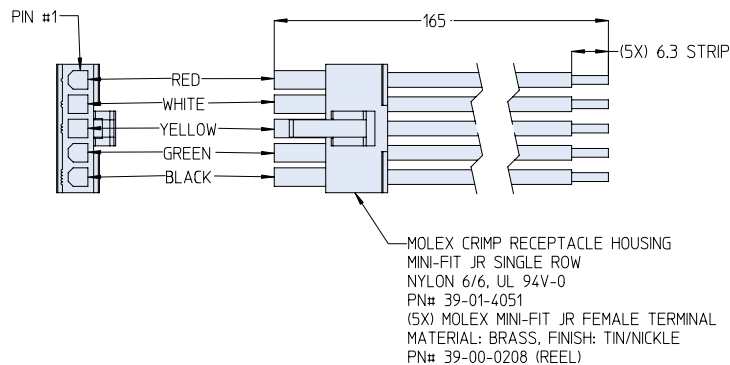
PN 5230002656 Power Harness for BB 158 312 mm 612158 230V 1Ph and 240V 3Ph



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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