

Electronic Control Systems

In This Section

Cabin Heating & Ventilation Systems

A range of Cabin Heating, Ventilation Systems and accessories by Eberspacher for automotive, industrial & marine applications.



Transportation Products

A range of transportation products by Cooper Bussmann such as vehicle electrical centres, fuse holders, fuses, circuit breakers and more.



Solenoids & Fuel Pumps

A selection of solenoids, solenoid accessories and fuel pumps by Flexible Drive Agencies, Woodward, Murphy, Airtex and Walbro for automotive and industrial applications.



DC Motors

A large range of DC Motors by DOGA for automotive applications.



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Series 31000/32000 Vehicle Electrical Centres



Cooper Bussmann's Single Vehicle Electrical Centre (VEC) and Dual Vehicle Electrical Centre (DVEC) are widely used Transportation Industry power distribution modules. The VEC & DVEC use patented programmable 3D matrix technologies that can be easily modified to accommodate changes to an electrical system. These can be customised for each specific electrical system, but requires no tooling for implementation.

The VEC & DVEC accept automotive components including fuses, relays, circuit breakers, diodes, and other devices that have 2.8mm wide terminals on 8.1 mm centreline spacing. The compact size of the VEC (about 4"x 4") and larger size of the DVEC (approximately 8"x 4") provide for high component density. VEC's provide either 8.0mm bladed inputs or M8/M6 stud inputs. The VEC can accommodate up to 2 input connectors - 4 bladed inputs or 2 studs - and 4 output connectors. The DVEC can accommodate up to twice this amount. (Some designs may limit the number of connectors available for use.)

Applications

The VEC/DVEC is ideal for distributed main power as well as auxiliary "add-on" applications. Current VEC/DVEC applications include Class 3-8 trucks, buses, chassis and RV, Con-Ag equipment, marine specialty vehicles, and automotive power distribution systems.

Benefits

The customisable designs of the VEC/DVEC enable them to incorporate many different devices and multiple design variations. Splices in the harness can also be eliminated by internally programming them into the grid matrix. The inputs (connector or stud) and outputs (connector) of the VEC/DVEC are color-coded and keyed, and provide quick installation. This makes the module easy to service. The largest benefit of these modules are the reduced lead times and zero tooling cost

Specifications

Input Terminal Rating: 8.0mm blade terminals (60A max per terminal); M8/M6 input studs (100A max per terminal). 200A max total for VEC, 400A max total for DVEC.

Output Terminal Rating: 2.8mm blade terminals (30A max per terminal).

Temperature Rating: -40°F (-40°C) to 260°F (125°C).

Materials: UL-Rated 94V-0 thermoplastic housing and connectors; Tin-plated copper internal grid.

Termination: Delphi Packard Metri-Pack® 280 Series terminals (sealed/unsealed & tanged/tangless) or Amps® terminals.* Delphi Packard 280 Series cavity plugs are installed where wires are not used.* Accepts #10-22 AWG wire sizes.

Mounting Torque Rating: 24in-lb (2.7Nm) max.

Mounting Orientation: Unit cannot be installed upside-down. Consult factory for proper mounting orientations.

Ingress Protection Rating: IP55.

Options

Cover: Vented (VEC), Solid with gasket (VEC/DVEC), Solid without gasket (DVEC), or none provided. **Cover Label:** Inside cover, outside cover (VEC only), or none provided.

Input Style: 8.0mm blade terminals or studs (M8/M6).

Mounting: External feet with mounting holes (VEC/DVEC) or internal mounting holes (VEC only).

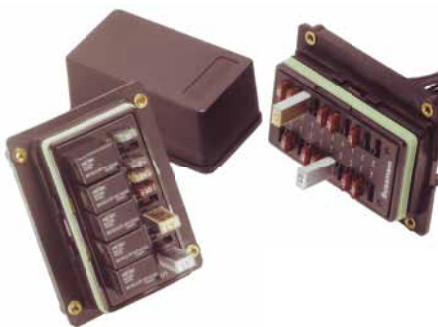
Components: Fuse, breaker, relay, etc. installation to be specified by customer.

Severe Service: Added environmental protection available.

Each design is customer specific. Consult your sales rep today for your application. MVEC Multiplexed for Canbus use.

NOTE: Vehicle Electrical Centres are made to customers specification. These are not an off the shelf item.

Series 15301 Rear Terminal Mini Fuse & Relay (continue over page)



Power Distribution Module

The Rear Terminal Mini Fuse and Relay panel (RTMR) provides efficient power distribution in a rugged compact form for applications in marine, construction, agriculture, heavy trucking, specialty vehicles, etc. This innovative product offers a weather tight enclosure (IP66/67) for various MINI (2.8mm) blade components when cover, cable seals, and cavity plugs are installed. It is available with various degrees of internal electrical bussing. Additionally, custom labels and multiple hardware configurations are available to solve any application need.

Specifications

Input Terminal Rating: M6 input studs on bussed/ partially bussed inputs: 80A max input on bussed fuse side, 80A max input on bussed relay side.

Output Terminal Rating: 2.8mm blade terminals (30A max per terminal)

Temperature Rating: -40°F (-40°C) to 260°F (125°C)

Materials: Black UL-Rated 94V-0 thermoplastic housing; Tin-plated copper internal bussing; Bright nickel-plated brass studs (on bussed versions).

Termination: Delphi Packard Metri-Pack® 280 Series terminals (sealed/tangless) or Amp® terminals.* Delphi Packard 280 Series cavity plugs are installed where wires are not used.* Accepts #12-22 AWG wire sizes.

Torque Rating: 75in-lb (8.5Nm) max.

Mounting Torque Rating: #10-32 threaded inserts, 24in-lb (2.7Nm) max torque.

Ingress Protection Rating: IP66-IEC 60529 (Valid when properly installed with cover, sealed terminals, and cavity plugs.) IP67 (Same requirements as IP66, but also needs a periodic - 3-9 months - coating of silicone lubricant applied to green base seal.)

Options

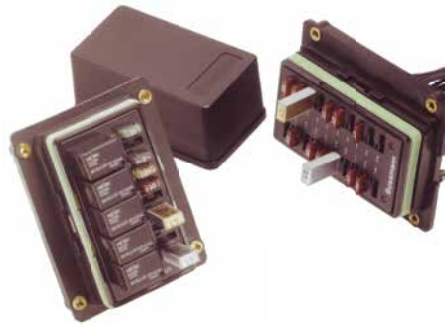
End Caps: Protective silicone end caps available for studded versions.

Mounting: Mounting brackets available for surface- mounting RTMR

Labels: Consult factory for custom label options.

Replacement Accessories: Consult factory for available service parts.

Series 15301 Rear Terminal Mini Fuse & Relay (continued)



Part No.	Configuration	Bussed	Cover
153011D11	.....20 fuse positions	Dual	Fuse
153012D12	.....10 fuse and 5 relay positions	Dual	Circuit breaker
153011D12	.....20 fuse positions	Dual	Circuit breaker
15303404	.....10 fuse and 5 relay positions	Non-Bussed	Circuit breaker
12110845	.....Terminals to suit RTMR		
12015323	.....Seal to suit 12110845		
12010300	.....Cavity plug		

Series 15710 Rear Terminal ATC® Fuse Block - 12 positon



The Rear Terminal ATC® Fuse Block (RTA) is a rear-fed panel with high component retention, which makes it an ideal choice for high vibration environments including construction, agriculture, bus, RV, heavy trucking equipment, etc. It is available in multiple lengths and internal bussing configurations. This allows for up to three separate power input circuits and 32 individual output circuits.

Specifications

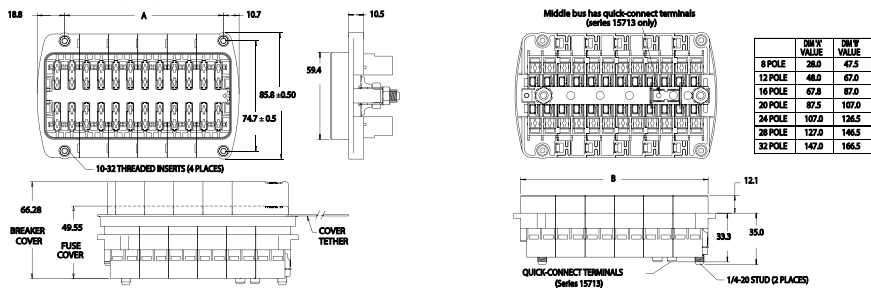
- Input Terminal Rating:** 1/4-20 stud; Quick-connect terminals provided on middle bus (Series 15713).
- 200A max total input for unit.
- Output Terminal Rating:** 30A max load per circuit.
- Temperature Rating:** -40°F (-40°C) to 260°F (125°C).
- Materials:** Black UL-Rated 94V-0 thermoplastic.
- Termination:** Delphi Packard Pack-Con® Series 3 & 5." I
- Input Wire Size:** #4-6 AWG. Output Wire Size: #10-16 AWG.
- Torque Rating:** 50in-lb (5.6Nm) max.
- Mounting Torque Rating:** #10-32 threaded inserts, 24in-lb (2.7Nm) max torque.

Options

- Positions:** 8-32 circuits available.
- Split Power:** Single, dual, or triple bus options.
- Cover:** Splash-resistant covers available. Short cover for fuses only, and taller cover for use with circuit breakers.
- Locks:** Secondary locks available for securing of output terminals. (Comes in multiples of 8 positions. Must order multiple strips to cover length of selected RTA.)
- Tools:** Output terminal removal tool . Secondary lock removal tool.
- Terminals sold separately Part No. JD21730**

Part No.....15711060611A

Dimensions (mm)



Series 15600 ATC® Blade Type Fuse Panels



The 15600 ATC® fuse block is a compact, yet rugged, power distribution module. It is available in a single or dual internal buss electrical configuration featuring an optional ground pad terminal strip. The 15600 fuse block is surface mounted, uses convenient quick-connect terminals, and is recommended as a supplemental power distribution module. It can be used to accompany main PDMs such as the Bussmann 31000/32000 Series VEC/DVEC, 15710 Series RTA, and the 15301 Series RTMR.

Specifications

- Input Terminal Rating:** #10-32 threaded studs (100A max).
- Output Terminal Rating:** 30A max per circuit.
- Temperature Rating:** -20°F (0°C) to 150°F (65°C).
- Materials:** Black UL-Rated 94V-0 thermoplastic.
- Termination:** .250" x .032" quick-connect terminals. Ground terminal pad option available.
- Input wire size:** #4-6 AWG.
- Output wire size:** #12-16 AWG.
- Torque Rating:** 20in-lb (2.25Nm) max.
- Mounting Torque Rating:** 8in-lb (0.9Nm) max.

Options

- Positions:** 4-20 circuits available.
- Split Power:** Single or dual buss options.

Part No.

- 156000620..... 6 Position
- 156001421..... 14 Position

LMG Big Blocks



Cooper Bussmann Transportation Products now offers a heavy power distribution module called the LMG (a.k.a. "BigBlock"). The LMG is used for main branch primary fusing and accepts multiple (2, 3 or 5) industry standard AMG fuses. Using a common input bus bar, the LMG requires just one input connection to power all fuses!

The Big Block provides efficient power distribution suitable for many "under the hood" applications such as marine, construction, agriculture, heavy trucking, bus & specialty vehicles.

Specifications

- Sizing:** 2, 3 and 5 positions available
- Ratings:** maximum total combined rating is 300a continuous
- Temperature:** -40°c (-40°f) to 85°c (185°f)
- Termination:** 5/16-18 or m8 studs, nuts, and lockwashers for fuse and surface mountings
- Torques:** mounting: 100 in-lbs (11.3nm) max; power input/output: 120 in-lbs (13.6nm) max
- Material:** **Housing:** black ul-rated 94 v-0 thermoplastic
- Cover:** red epdm cover for protection from accidental shorts
- Studs:** plated steel

Part No.

- LMG31001.....3 positions
- LMG51001.....5 positions

Series 37700 PRM & PFM



Power Relay Module

Cooper Bussmann offers a sealed Power Relay Module (PRM) along with an accompanying Power Fuse Module (PFM). These compact power distribution modules are designed for high current applications, and are suitable for placement in extreme moisture and high vibration environments. The PRM contains a 70A moulded-in relay and two female fuse positions. One of these fuses protects the relay and the other is a single-circuit inline fuse.

The PFM contains only two fuses - each a separate circuit. A silicone seal and removable cover offer a weather-tight enclosure for the fuse positions. PRMs/PFMs also feature rugged M8 power input studs. Multiple units may be connected together via a custom buss bar, or can be bussed to any of Cooper Bussmann's PDMs (i.e. 31000/32000 Series VEC/DVEC, 15301 Series RTMR, etc.)

Specifications

- PRM Rating:** 70A, 12VDC steady-state relay; 24VDC relay also available. Relay protection fuse: up to 60A; Non- switched inline fuse: up to 60A.
- PFM Rating:** Each inline fuse rated up to 60A.
- Temperature Rating:** -40°f (-40°c) to 185°f (85°c).
- Materials:** UL-Rated 94V-0 thermoplastic body and cover; Silicone seal; Tin-plated copper terminals; Plated steel studs.
- Input Termination:** M8 threaded stud. PRM Switching/Trigger Signal: Delphi Packard Metri-Pack® 150 Series; AmpSeal® 16.*
- Torque Rating:** Input stud: 144in-lb (16.3Nm) max.; Output stud: 48in-lb (5.4Nm) max.
- Mounting Torque Rating:** 48in-lb (5.4Nm) max.
- Ingress Protection Rating:** IP66 (excluding stud connections)

Options

- Mounting:** Counter rotation feature (CRF) available to prevent rotation on single bolt installations.
- Bussing:** Custom bussing available for joining multiple PRMs/PFMs. Options also available for bussing PRMs/PFMs to other Bussmann power distribution modules.
- Accessories:** Stud caps, separators, service components. Consult factory for details.

Part No.

- 377021AN0012.....12V
- 377021AN0024.....24V
- 377011NN0011..... Power Fuse Module
- 2103430.....PRM Plug includes plug, terminals, retainer & seals

Fuses available for PRM & PFM

Part No.	AMP Rating
FMX20.....	20
FMX30.....	30
FMX40.....	40
FMX50.....	50
FMX60.....	60

HMG Fuse Holder (continued over page)



Automotive Bolt-In Fuseholder for the AMG Fuse

The HMG fuse holder accepts industry standard AMG fuses for primary fusing applications. The narrow rugged body makes it ideal for demanding environments such as "under the hood" locations in construction, agriculture, heavy trucking, and specialty vehicle applications.

Features

Side-stackable, Bottom side insulated from mounting panel and Splash resistant cover.

HMG Fuse Holder (continued)

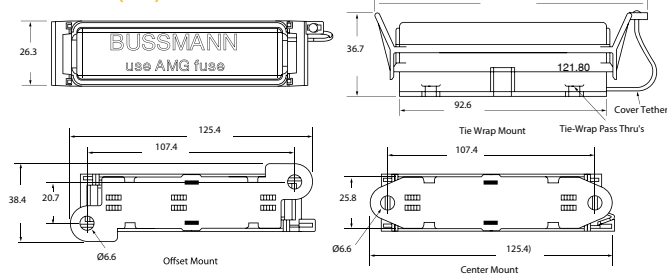


Specifications

Rating: For use with AMG fuses from 100-300A.
Temperature Rating: -40°F (-40°C) to 260°F (125°C).
Materials: Black UL-Rated 94V-0 thermoplastic with zinc-plated steel studs.
Termination: M8 or 5/16-18 threaded studs and hex nuts for fuse mounting. Wire sizes: #2-8 AWG.
Torque Rating: 150in-lb (17Nm) max.
Mounting Torque Rating: Optional mounting hole patterns, 44in-lb (5Nm) max.

Part No......15711060611A

Dimensions (mm)



FMG Fuse Holder



Full Access Automotive Bolt-In Fuseholder for the AMG Fuse

The FMG fuse holder accepts industry standard AMG fuses for primary fusing applications. The FMG is offered with a tough elastomer cover for fuse protection, yet allows for cable input from various orientations. This fuse holder cover is available in multiple colors and lengths. Similar to Bussmann's HMG holder, the FMG is well suited for demanding environments such as under the hood locations in construction, agriculture, heavy trucking, and specialty vehicle applications.

Specifications

Rating: For use with AMG fuses from 40-300A.
Temperature Rating: -40°F (-40°C) to 260°F (125°C).
Materials: Black UL-Rated 94V-0 thermoplastic with zinc-plated steel studs; thermoplastic elastomer cover.
Termination: M8 or 5/16-18 threaded studs and hex nuts for fuse mounting. Wire sizes: #2-8 AWG.
Torque Rating: 120in-lb (13.5Nm) max.
Mounting Torque Rating: 1/4-20 screws with washers (recommended), 44in-lb (5Nm) max.

Options

Cover: Available in black or red. Extended cover length also available.

Features

Full access for cables. Can be routed to studs from nearly every direction.

Stud Type Junction Blocks



Specifications

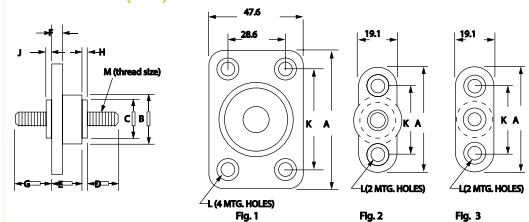
Applications: Heavy-duty ground or power connection points in AC or DC circuits. Feed through or stand alone mount options available for transformers, communication and computer power sections along with various vehicle electrical systems.
Mounting Torque Rating: 48in-lb (5.4Nm) max.
 Modular design offers design and manufacturing flexibility.

Suggested Max. Termination Ratings: Dimensions (mm)

Thread/Stud Size Amperages

- #10.....50 amps
- #1/4 & M6.....100 amps
- #5/16.....200 amps
- #3/8.....250 amps
- #1/2.....400 amps

Other sizes available on request.



Part No.	Fig.	A	B	C	D	E	F	G	H	J	K	L	M	Max. Torque (in-lbs)	Material	Colour
C1925B*	1	2.75	1.5	1.25	1.25	1.12	.37	1.12	.19	.19	2.0	.22 dia. W/.44 dia. C'bore x .16 deep	1/2-13	300	Thermoplastic/ Zinc-plated Brass	Black
C19252B*	1	2.75	1.5	1.25	1.25	1.12	.37	1.12	.19	.19	2.0	.22 dia. W/.44 dia. C'bore x .16 deep	3/8-16	150	Thermoplastic/ Tin-plated Brass	Black
C19331	1	2.75	1.44	1.25	1.5	1.12	.37	None	.19	None	2.0	.22 dia.	5/16-18	75	Thermoplastic/ Zinc-plated Brass	Black
C7018*	3	2.06	.69	.44	.47	.69	.31	.53	.06	.06	1.31	.22 dia. w/.41 dia. C'bore x .14 deep	M6	55	Thermoplastic/ Zinc-plated Steel	Black
JB38162	2	2.12	.98	.62	.87	.69	.31	None	.06	None	1.37	.22 dia. w/.37 dia. C'bore x .14 deep	3/8-16	150	Thermoplastic/ Zinc-plated Steel	Black
JB38163	2	2.12	.98	.62	.87	.69	.31	None	.06	None	1.37	.22 dia. w/.37 dia. C'bore x .14 deep	3/8-16	150	Thermoplastic/ Zinc-plated Steel	Red

* Feed Thru

Series 187 Marine Rated Circuit Breaker



Specifications

Single Pole Thermal Type Breakers
Applications: Typically used in DC power systems in marine applications (as a main or branch circuit breaker), truck and bus systems, RV systems, add-on protection for accessories, lift gates, etc. This unit is external ignition protected and weatherproof.
Amp Ratings Available: 25-150A, 48VDC.
Interrupt Rating: Main Breaker Protection Interrupt Rating (5kA @ 12VDC). (Consult factory for higher voltage interrupt ratings.)
Operating Temperature Rating: -40° F (-40° C) to 185° F (85° C).
Storage Temperature Rating: -40° F (-40° C) to 260° F (125° C).
Materials: Black UL-Rated 94V-0 thermoset plastic body. Cover and lever are UL-Rated 94V-0 thermoplastic.
Marking: Standard marking includes amp/volt ratings. Custom markings also available.
Termination: 5/16-18 threaded studs.
Torque Rating: 75in-lbs (8.5Nm) max.
Mounting Torque Rating: Panel or surface-mount options; 50in-lb (5.6 Nm) max.
Ingress Protection Rating: IP66
Features / Options: A manual reset circuit breaker with On-Off switch capability.
Compliances: ABYC E-11; CE; SAE J1171 (Ignition protected).
 Consult factory for time characteristic curves.

All Amp Ratings available on request, though may not be in stock at all times.

Series 25X Mid-Range Circuit Breakers



Manual Reset Circuit Breakers

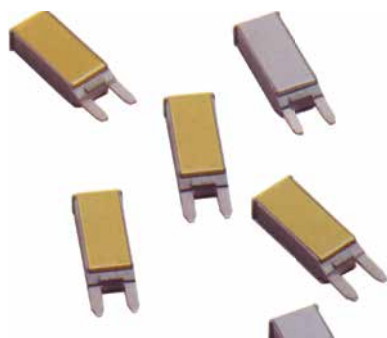
Automatic, Manual and Manual W/ Push-to-Trip

Specifications

Single Pole Thermal Type Breakers
Applications: This unit is external ignition protected and weatherproof. It is typically used in DC power systems in marine applications (as a main or branch circuit breaker), truck, bus and RV systems, add on protection for accessories, etc.
Rating: 10-50A, 32ADC
Interrupt Rating: Circuit Protection (2.5kA) per ABYC E-11.
Operating Temperature Rating: -40 C to 85 C
Storage Temperature Rating: -40 C to 125 C
Materials: Black UL Rated 94V-0 thermoset plastic body. Cover, level and button are UL-Rated 94V-0 thermoplastic. Cover has a elastomer overmold.
Marking: Standard marking includes amp/volt ratings, part numbers and "SAE Type B."
Termination: #10-32 threaded studs.
Torque Rating: 24in-lb (2.7Nm) max.
Mounting Torque Rating: Panel mount with either # 8-32 threaded inserts or # 10 clearance holes. 18in-lb (2.0Nm) max
Ingress Protection Rating: IP66
Features/Options: Series 254 & 255 also features a Push-to-Trip option.
Compliances: SAE J553; ABYC E-11; SAE J1171 (ignition protected).

Part No.	AMP Rating
25510B1.....	10
25515B1.....	15
25520B1.....	20
25525B1.....	25
25530B1.....	30
25535B1.....	35
25540B1.....	40
25545B1.....	45
25550B1.....	50

Series 21X Mini Circuit Breakers



Single Pole Thermal Type Breakers

Rating: 5-30A; 14Vdc (28V for Type III)
Interrupt Rating: 150A @ 14Vdc (5-10A versions); 225A @ 14Vdc (15A version); 300A @ 14Vdc (20A version); 450A @ 14Vdc (25-30A versions)
Operating Temperature Rating: -40° F (-40° C) to 185° F (85° C)
Storage Temperature Rating: -40° F (-40° C) to 260° F (125° C)
Materials: Grey UL-Rated 94V0 thermoplastic housing with metal cover: gold (Type I) or silver (Type II) is available.
Marking: Standard marking includes amp/voltage ratings, part number, and date code. OCR marking is available.
Termination: Compatible with 280 Type fuse blocks using 0.32in. (8.1mm) centerline spacing
Compliances: SAE J553 Type I, Type II and Type III Circuit Breakers

Part No.	AMP Rating
22105300.....	5
22110300.....	10
22115300.....	15
22120300.....	20
22125300.....	25
22130300.....	30

ATC® Circuit Breakers



Specifications

Single Pole Thermal Type Breakers

Rating: 5-30A, 28VDC

Interrupt Rating: 400A @ 28VDC

Operating Temp Rating: -40°C to 85°C

Storage Temp Rating: -40°C to 125°C

Materials: UL-Rated 94V-0 thermoplastic bod. Tin plated copper alloy terminals.

Marking: Colour is colour-coded to amperage ratings.

Termination: 5.2mm wide blades compatible with ATC type fuse blocks.

Compliances: SAEJ553; SAE J1284; ISO 8820-3; DIN 72581-3 Type C.

Part No.	AMP Rating
2270500.....	5A
2271000.....	10A
2271500.....	15A
2272000.....	20A
2272500.....	25A
2273000.....	30A

AMG Fuses



Specifications

Current Rating: 100-300A.

Voltage Rating: 32Vdc*

Interrupt Rating: 1,000A @ 32Vdc

Housing Material: UL-rated 94V0 thermoplastic

Terminal Material: Copper

Mounting: M8 or 5/16-18 or less studs on 2.00 in (50.8mm) centers

Max torque of 8.1 to 9.6 ft-lbs (12 ±1N•m)

Suitable for use with the FMG Fuse Holder (see page 28)

Part No.	AMP Rating
AMG6040.....	40
AMG6060.....	60
AMG6080.....	80
AMG100.....	100
AMG125.....	125
AMG150.....	150
AMG175.....	175
AMG200.....	200
AMG250.....	250
AMG300.....	300

ATM Mini Blade Fuses



Specifications

Current Rating: 2-30A.

Voltage Rating: 32VDC

Interrupt Rating: 1,000A @ 32VDC.

Housing Material: UL-Rated 94V-0 thermoplastic.

Terminal Material: Silver Plated zinc alloy.

Marking: Amperage marking is OCR compliant.

Compliances: UL-Listed; SAE J2077; ISO 8820-3; SAE 31171 (Ignition protected)

Part No.	AMP Rating
ATM05CB.....	5
ATM10CB.....	10
ATM15CB.....	15
ATM20CB.....	20
ATM25CB.....	25
ATM30CB.....	30

Standard Blade Fuses



Specifications

Current Rating: 5-40A.

Voltage Rating: 32VDC

Interrupt Rating: 1,000A @ 32VDC.

Housing Material: UL-Rated 94V-0 thermoplastic.

Terminal Material: Tin Plated zinc alloy.

Marking: Amperage marking is OCR compliant.

Compliances: UL-Recognised (3-40A); SAE J1284; ISO 8820-3

Part No.	AMP Rating
ATC05.....	5
ATC10.....	10
ATC15.....	15
ATC20.....	20
ATC25.....	25
ATC30.....	30
ATC40.....	40

DC Solenoids

FLEXIBLE DRIVE AGENCIES



For Diesel Engine Shut-Down or Throttling

Uniquely Australian made - FDA - 3 Wire Solenoids provide reliable control over diesel engine shut down or throttling. Wired through the starter solenoid circuit or separate time delay relay the three wire circuitry avoids the problems of internally switched types. Available in 12 and 24 Volt versions and two basic sizes. All models protected from dust and moisture entry and include integral return spring.

Part No.	Voltage	Stroke	Pull Force	Hold Force
BT12.....	12VDC.....	38.1mm.....	89 N.....	245 N.....
BT 24.....	24VDC.....	38.1mm.....	89 N.....	245 N.....
BT12A.....	12VDC.....	25.4mm.....	66 N.....	245 N.....
BT24A.....	24VDC.....	25.4mm.....	66 N.....	245 N.....

Woodward Dual Coil Solenoids



To allow a solenoid to be held energized for long periods of time without overheating, Woodward uses two separate coil windings instead of one. The first wound coil operates at a high current level to provide maximum pull. The second wound coil simply holds the plunger in place after it has completed its stroke and "bottomed out." Since the current required to hold the plunger in place is low, dual coil solenoids can be energized continuously without overheating. This unique design concept results in a highly efficient compact solenoid approximately one half the size of a comparable single coil unit. Also available are stronger pull, Woodward OE solenoids & kits.

Part No.	Voltage	Stroke	Pull Force	Hold Force	Pull Amp	Hold Amp
150412V.....	12V.....	25.4mm.....	53 N.....	85 N.....	41 A.....	0.76 A.....
150424V.....	24V.....	25.4mm.....	53 N.....	85 N.....	22 A.....	0.37 A.....
175112V.....	12V.....	25.4mm.....	107 N.....	169 N.....	46 A.....	1.1 A.....
175124V.....	24V.....	25.4mm.....	107 N.....	169 N.....	25 A.....	0.5 A.....
200312V.....	12V.....	25.4mm.....	116 N.....	227 N.....	60 A.....	0.8 A.....
200324V.....	24V.....	25.4mm.....	116 N.....	227 N.....	37 A.....	0.4 A.....

In Line Swivel



Compensates for possible misalignment between rigid linkage and solenoid plunger. 1/4" thread. Suitable for most solenoids.

Part No.....09000002457

Murphy Push/Pull Solenoids



Murphy push pull solenoids provide single unit versatility for engine applications, such as shutdown. A choice of two models and two voltages is available. All models come complete with a return spring and a rubber seal boot. Both sides of the solenoid will accept 1/4 inch threaded rod.

Part No.	Description
RP2307.....	12V, 1 In. (25 mm) Stroke, 11 Lbf (49 N) Pull, 23 Lbf (102 N) Hold
RP2308.....	24V, 1 In. (25 mm) Stroke, 11 Lbf (49 N) Pull, 23 Lbf (102 N) Hold 12 Vdc, 1-1/2
RP2309.....	12V, 1-1/2 In. (38 mm) Stroke, 14 Lbf (62 N) Pull, 34 Lbf (151 N) Hold
RP2310.....	24V, 1-1/2 In. (38 mm) Stroke, 14 Lbf (62 N) Pull, 34 Lbf (151 N) Hold

Fuel Lock Solenoid

FLEXIBLE DRIVE AGENCIES



For use in conjunction with engine protection systems ie CP310F to shut off fuel. Available in 12 volt only.

Part No......SOL0612

Solenoid Timer

FLEXIBLE DRIVE AGENCIES



Engine Control

Description: This unit has been designed to provide safe and automatic operation for the entire range of 12 or 24 volt FDA solenoids. The pull in coil is energized for a precise period of time and the solenoid is automatically switched to the hold mode. Burn outs to the pull in coil are eliminated due to excessive time taken in applying power. e.g. when wired to a faulty or slow starting engine via the starter relay.

Part No......FD2001

E8000 Series Universal Fuel Pumps



New Universal Solid State E8012S Series Electric Fuel Pump features advanced technology. Exclusive design provides increased vapour handling capacity. Solid state engineering has no electrical contact points to wear out and it is highly resistant to voltage spikes, even reversed polarity. Permanently sealed construction with no screws to loosen or leak. Impervious to corrosion from alcohol blended fuels. Available for both domestic and import carbureted applications.

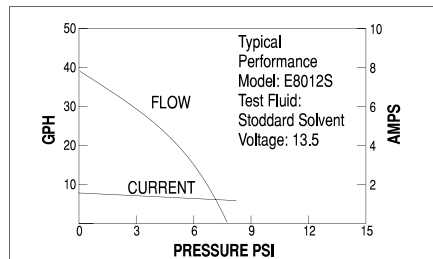
Part No.

E8012S.....5-9 PSI, 5/16" Hose

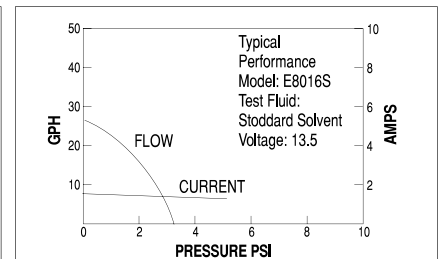
E8016S.....2.5-4.5 PSI, 5/16" Hose

Flowgraph

E8012S



E8016S



Walbro Gerotor 255lph High Performance In Tank Fuel Pumps



The Walbro high output in-tank electric fuel pumps are available in flow ratings of 255 litres of fuel per hour. These particular pumps flow significantly more fuel at higher pressure. For example, at 80 PSI the standard 255 lph pump will flow around 132 litres per hour. At that same 80 PSI the equivalent HP (high pressure) fuel pump will flow over 210 litres (50 gallons) per hour.

Walbro in-tank electric fuel pumps utilise a proven gerotor design. The outside dimensions, however, are compact enough to fit existing hanger assemblies, with little modification.

Part No......GSS342

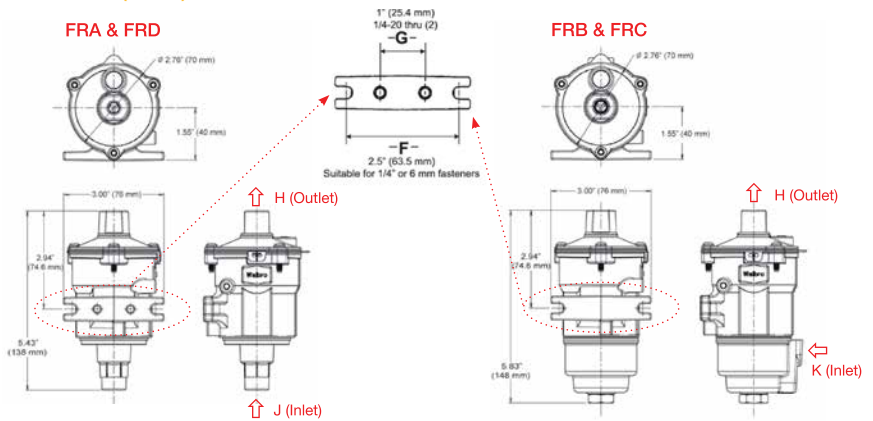
Reciprocating Fuel Pumps



Standard Features - All Below Models

- Current requirement: < 2 amps average
- Reverse polarity protected up to 60 minutes
- Self priming (dry lift) of more than 120cm (48")
- Dry run to four (4) hours
- Compatible with all commercially available pump grade petrol, diesel or bio-diesel
- Operating temperature: -40 ~ +70C (-40 ~ +155F)
- Transient voltage protected to 100 volts
- U.S. Coast Guard 16623-1 and 16623-2 approved
- European CE Standards EN 61000-6-2 and EN 6-3-2100 approved

Dimensions (in/mm)



FRA & FRD Model Unique Features

FRA

For applications where low cost and durability are required.

- Flow: to 190 lph (52 gph)
- Continuous duty life (diesel fuel): > 5000 hrs
- Weight: 0.74 kg (1.63 lbs)
- Pump cycles continuously when power is on

FRD

For applications where battery life, low noise and durability are important.

- Flow: to 210 lph (55 gph)
- Continuous duty life (diesel fuel): >10000 hrs
- Weight: 0.83kg (1.83lbs)
- Pump cycles continuously when power is on



Part No.

- FRA11.....12V
- FRD11.....12V

FRB & FRC Model Unique Features

FRB

For applications where battery life, low noise and durability are important and fuel quality is questionable.

- Flow: to 160 lph (35 gph)
- Ampere hours: up to 70% less than FRA & FRC
- Continuous duty life (diesel fuel): >18000 hrs
- Weight: 0.83 kg (1.83 lbs)
- Pump cycles only when fuel is demanded
- Replaceable filter

FRC

For applications where low costs and better durability are important and fuel quality is questionable.

- Flow: to 210 lph (55 gph)
- Ampere hours: up to 70% less than FRA & FRC
- Continuous duty life (diesel fuel): >10000 hrs
- Weight: 0.75 kg (1.65 lbs)
- Pump cycles only when fuel is demanded
- Replaceable filter



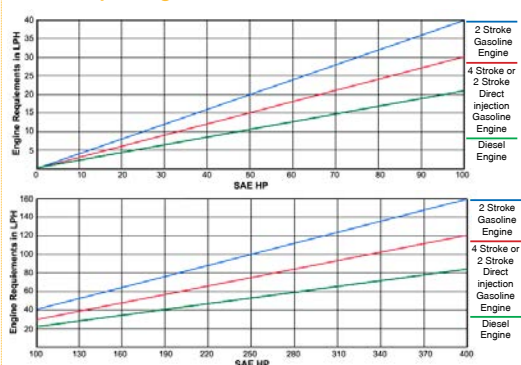
Part No.

- FRB21.....24V, 8-11 PSI, 45 GPH, Dry lift to 48" (120cm)
- FRB51.....12V, 8-11 PSI, 45 GPH, Dry lift to 48" (120cm)
- FRB61.....12V, 4-6 PSI, 32 GPH, Dry lift to 48" (120cm)
- *FRB132.....12V, Suitable for Marine, 6-8 PSI, 43 GPH, Dry lift 48" (120cm)
- *FRB162.....24V, Suitable for Marine, 6-8 PSI, 43 GPH, Dry lift 48" (120cm)
- FRC82.....12V, 8-11 PSI, 32 GPH, Dry lift to 120" (305cm)

To Calculate Pump Size Requirements

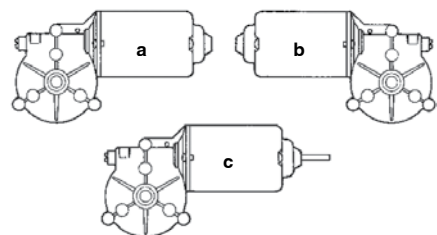
- 1) Engine fuel requirements (in lph) shown in the above charts is an approximation based on the following calculation:
 - a. Two Stroke engines = (HP)(.40) (based on BSFC of .67#/HP/HR)
 - b. Four stroke or direct injected two stroke engines = (HP)(.30) (based on BSFC of .50#/HP/HR)
 - c. Diesel engines = (HP)(.25) (based on BSFC of .42#/HP/HR)
- 2) Consider an additional hot fuel (for gasoline applications) allowance of up to 30% (application specific)
- 3) Consider an additional fuel allowance for injector pump cooling (diesel applications only)
- 4) Consider an additional safety allowance for certain applications where fuel lines, filters, etc. create abnormal pressure losses (confirmation by testing recommended)
- 5) For additional application assistance, contact Walbro Engine Management

Fuel Pump Sizing Guidelines



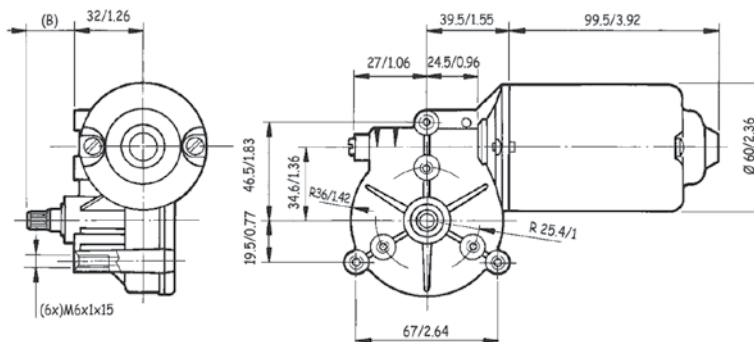
111 Series Motor With Gear

DOGA



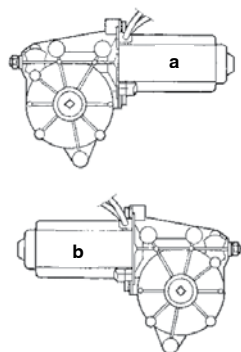
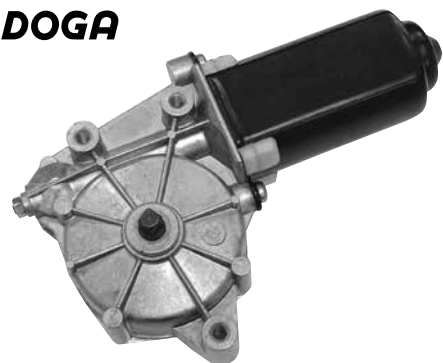
Part No.	Nominal Voltage		Nominal Torque	Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Transmission Ratio	Approximate weight	Water tightness	Wheel material	Design: a, b, c	Curve
	Un (V)	Mn (N.m./ lb.ft.in)	nn (r.p.m)	In (A)	la (A)											
11137112000	12	5/44.2	40	5	25/221.2	25	E22	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11137113000	24	5/44.2	40	2.5	25/221.2	13	E22	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11137612000	12	5/44.2	40	5	25/221.2	25	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11137613000	24	5/44.2	40	2.5	25/221.2	13	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11137612000E	12	5/44.2	40	5	25/221.2	25	E23	C25	F2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11137613000E	24	5/44.2	40	2.5	25/221.2	13	E23	C25	F2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11137632000	12	6/53.1	25	4	25/221.2	15	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	3	
11137633000	24	6/53.1	25	2	25/221.2	8	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	3	
11147613000	24	5/44.2	40	2.5	25/221.2	13	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	b	1	
11190312000	12	3/26.5	70	6	25/221.2	34	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	2	
11190313000	24	3/26.5	70	3	25/221.2	17	E23	C25	EE2	62:1	1.25 / 3.34	IP53	PLA	a	2	
11190393000	24	1.5/13.2	240	4	14/123.9	23	E23	C26	EE1	49:4	1.25 / 3.34	IP53	PLA	a	4	
11190413000	24	5/44.2	40	2.5	25/221.2	13	E24	C25	EE2	62:1	1.30 / 3.48	IP53	BRO	a	1	
11190942000	12	5/44.2	40	5	25/221.2	25	E52	C2	EE2	62:1	1.25 / 3.34	IP53	PLA	a	1	
11191073000	24	1.5/13.2	240	4	14/123.9	23	E24/E53	C26	EE1	49:4	1.25 / 3.34	IP40	CEL	c	4	
11191143000	24	3/26.5	70	3	25/221.2	17	E24/E54	C37	EE2	62:1	1.25 / 3.34	IP40	PLA	c	2	
11191993000	24	3/26.5	100	3	20/177.01	24	E24	C26	F3	59:2	1.25 / 3.34	IP53	PLA	a	59	

Dimensions (mm/in)



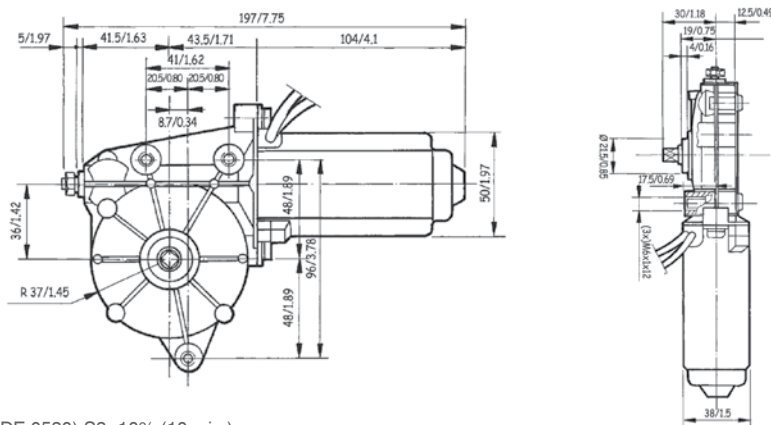
210 Series Motor With Gear

DOGA



Part No.	Nominal Voltage		Nominal Torque	Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Transmission Ratio	Approximate weight	Water tightness	Wheel material	Design: a, b	Curve
	Un (V)	Mn (N.m./ lb.ft.in)	nn (r.p.m)	In (A)	la (A)											
210010220D0	12	3/26.5	55-75	7.5	10/88.5	28	E39	C38	EE16	60:1	0.95 / 2.54	IP40	PLA	a	17	
210010220I0	12	3/26.5	55-75	7.5	10/88.5	28	E39	C38	EE16	60:1	0.95 / 2.54	IP40	PLA	b	17	
210010230D0	24	3/26.5	55-75	4	10/88.5	14	E39	C38	EE16	60:1	0.95 / 2.54	IP40	PLA	a	17	
210010230I0	24	3/26.5	55-75	4	10/88.5	14	E39	C38	EE16	60:1	0.95 / 2.54	IP40	PLA	b	17	

Dimensions (mm/in)



(VDE 0530) S3 -10% (10 min.)

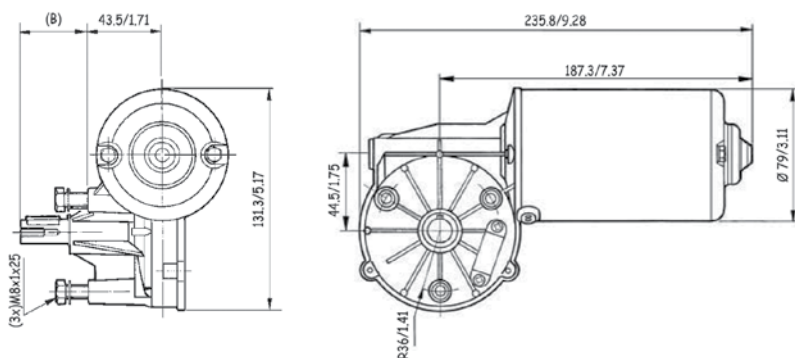
258 Series Motor With Gear

DOGA



Part No.	Nominal Voltage		Nominal Torque		Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Transmission Ratio	Approximate weight	Water tightness	Wheel material	Curve
	Un (V)	Mn (N.m./ lbf.in)	nn (r.p.m)	In (A)		la (A)					i	P (kg / lb.t)	IP			
25817102000	12	15/133	25	10	80/708	42	E36 C34	F2	52:1	3.00 / 8	IP53	PLA	18			
25817103000	24	15/133	25	5	80/708	21	E36 C34	F2	52:1	3.00 / 8	IP53	PLA	18			
25837102000	12	15/133	25	10	80/708	42	E36 C34	EE2	52:1	3.00 / 8	IP53	PLA	18			
25837103000	24	15/133	25	5	80/708	21	E36 C34	EE2	52:1	3.00 / 8	IP53	PLA	18			
25837122000	12	12/106	40	12	80/708	55	E36 C34	EE2	52:1	3.00 / 8	IP53	PLA	19			
25837123000	24	12/106	40	6	80/708	32	E36 C34	EE2	52:1	3.00 / 8	IP53	PLA	19			
25890262000	12	12/106	40	12	80/708	55	E36 C34	EE2	52:1	3.00 / 8	IP53	CEL	19			
25890263000	24	12/106	40	6	80/708	32	E36 C34	EE2	52:1	3.00 / 8	IP53	CEL	19			

Dimensions (mm/in)



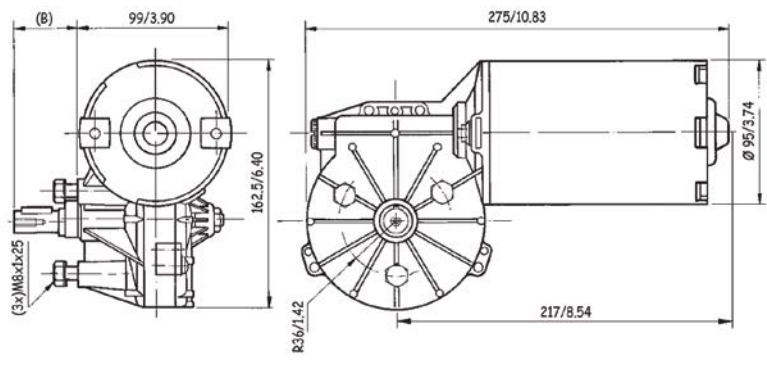
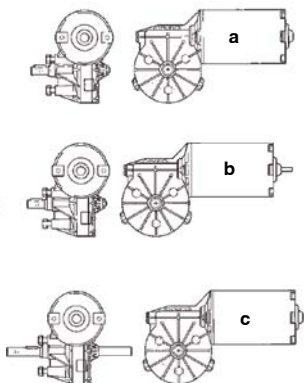
259 Series Motor With Gear

DOGA

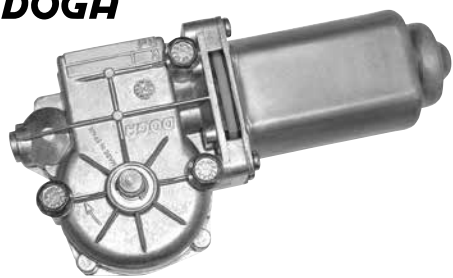


Part No.	Nominal Voltage		Nominal Torque		Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Transmission Ratio	Approximate weight	Water tightness	Wheel material	Design: a, b, c	Curve
	Un (V)	Mn (N.m./ lbf.in)	nn (r.p.m)	In (A)		la (A)					i	P (kg / lb.t)	IP				
25937102000	12	20/177	22	12	130/1150	60	E37 C34	EE2	50:1	5.90 / 15.80	IP53	PLA	a	20			
25937103000	24	20/177	22	6	130/1150	30	E37 C34	EE2	50:1	5.90 / 15.80	IP53	PLA	a	20			
25990012000	12	15/132.7	40	18	120/1062	98	E37 C34	F2	50:1	5.90 / 15.80	IP53	PLA	a	21			
25990013000	24	15/132.7	40	9	120/1062	49	E37 C34	F2	50:1	5.90 / 15.80	IP53	PLA	a	21			
25990083000	24	25/221	25	7	135/1195	30	E37/E51	C34	EE2	50:1	5.90 / 15.80	IP40	PLA	b	22		
25990163000	24	20/177	22	6	130/1150	30	E37 C34	EE2	50:1	5.90 / 15.80	IP53	CEL	a	20			
25990272000	12	20/177	22	12	130/1150	60	E61/E62	C40	EE1	50:1	6.0 / 16.07	IP53	CEL	c	20		

Dimensions (mm/in)



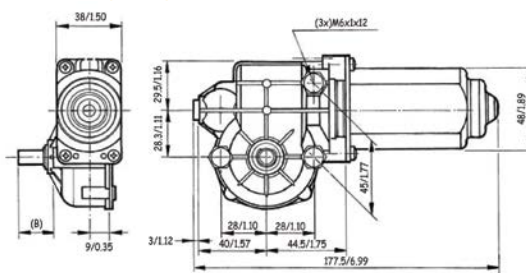
DOGA



316 Series Motor With Gear

Part No.	Nominal Voltage		Nominal Torque		Nominal speed		Nominal current		Starting torque		Starting Current		Shaft	Connections	Wiring diag.	Transmission Ratio	Approximate weight		Water tightness	Wheel material	Curve
	Un (V)	Mn (N.m./ lb.ft)	nn (r.p.m)	ln (A)	Starting torque	Starting Current	la (A)	P (kg / lb.t)	IP												
31627112000	12	2/17.70	38	3.4	10 / 88.5	12	E29	C30	EE4	62:1	0.90 / 2.41	IP40	PLA	56							
31627113000	24	2/17.70	38	1.7	10 / 88.5	6	E29	C30	EE4	62:1	0.90 / 2.41	IP40	PLA	56							
31627612000	12	2/17.70	38	3.4	10 / 88.5	12	E30	C30	EE4	62:1	0.90 / 2.41	IP40	PLA	56							
31627613000	24	2/17.70	38	1.7	10 / 88.5	6	E30	C30	EE4	62:1	0.90 / 2.41	IP40	PLA	56							
31627612000E	12	2/17.70	38	3.4	10 / 88.5	12	E30	C30	F4	62:1	0.90 / 2.41	IP40	PLA	56							
31627613000E	24	2/17.70	38	1.7	10 / 88.5	6	E30	C30	F4	62:1	0.90 / 2.41	IP40	PLA	56							
31697283000	24	2/17.70	38	1.7	10 / 88.5	6	E30	C30	EE4	62:1	0.90 / 2.41	IP40	BRO	56							
31697312000 *	12	1.5 / 13.27	65	6.0	10 / 88.5	22	E30	C30	EE4	62:1	0.90 / 2.41	IP40	PLA	57							
31697313000 *	24	1.5 / 13.27	65	3.0	10 / 88.5	11	E30	C30	EE4	62:1	0.90 / 2.41	IP40	PLA	57							

Dimensions (mm/in)



* (VDE 0530) S3 - 10% (10min)

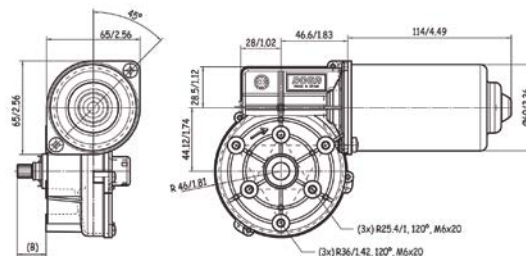
DOGA



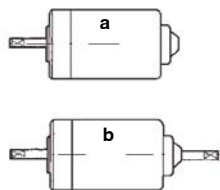
319 Series Motor With Gear

Part No.	Nominal Voltage		Nominal Torque		Nominal speed		Nominal current		Starting torque		Starting Current		Shaft	Connections	Wiring diag.	Transmission Ratio	Approximate weight		Water tightness	Wheel material	Design: a, b	Curve
	Un (V)	Mn (N.m./ lb.ft)	nn (r.p.m)	ln (A)	Ma (N.m./Lb.ft)	la (A)	P (kg / lb.t)	IP														
31938602000	12	9 / 79.6	30	7	50 / 442.5	28	E35	C37	EE4	81:1	1.7 / 4.55	IP55	PLA	a	58							
31938603000	24	9 / 79.6	30	3	50 / 442.5	15	E35	C37	EE4	81:1	1.7 / 4.55	IP55	PLA	a	58							
31938622000	12	8 / 70.8	45	6	50 / 442.5	50	E35	C37	EE4	81:1	1.7 / 4.55	IP55	PLA	a	60							
31938623000	24	9 / 79.6	45	3	60 / 531	25	E35	C37	EE4	81:1	1.7 / 4.55	IP55	PLA	a	61							
31938462000	12	3 / 26.5	95	6	35 / 309.8	60	E35	C37	EE4	78:2	1.7 / 4.55	IP55	PLA	a	62							
31938463000	24	3 / 26.5	95	3	35 / 309.8	30	E35	C37	EE4	78:2	1.7 / 4.55	IP55	PLA	a	63							
31918602000	12	9 / 79.6	30	7	50 / 442.5	28	E35	C37	F2	81:1	1.7 / 4.55	IP55	PLA	a	58							
31918603000	24	9 / 79.6	30	3	50 / 442.5	15	E35	C37	F2	81:1	1.7 / 4.55	IP55	PLA	a	58							
31918622000	12	8 / 70.8	45	6	50 / 442.5	50	E35	C37	F2	81:1	1.7 / 4.55	IP55	PLA	a	60							
31918623000	24	9 / 79.6	45	3	60 / 531	25	E35	C37	F2	81:1	1.7 / 4.55	IP55	PLA	a	61							
31918462000	12	3 / 26.5	95	6	35 / 309.8	60	E35	C37	F2	78:2	1.7 / 4.55	IP55	PLA	a	62							
31918463000	24	3 / 26.5	95	3	35 / 309.8	30	E35	C37	F2	78:2	1.7 / 4.55	IP55	PLA	a	63							
31938202000	12	9 / 79.6	30	7	50 / 442.5	28	E35	C37	EE4	81:1	1.7 / 4.55	IP55	BRO	a	58							
31938203000	24	9 / 79.6	30	3	50 / 442.5	15	E35	C37	EE4	81:1	1.7 / 4.55	IP55	BRO	a	58							
31938222000	12	8 / 70.8	45	6	50 / 442.5	50	E35	C37	EE4	81:1	1.7 / 4.55	IP55	BRO	a	60							
31938223000	24	9 / 79.6	45	3	60 / 531	25	E35	C37	EE4	81:1	1.7 / 4.55	IP55	BRO	a	61							
31938062000	12	3 / 26.5	95	6	35 / 309.8	60	E35	C37	EE4	78:2	1.7 / 4.55	IP55	BRO	a	62							
319380630.00	24	3 / 26.5	95	3	35 / 309.8	30	E35	C37	EE4	78:2	1.7 / 4.55	IP55	BRO	a	63							
31948602000	12	9 / 79.6	30	7	50 / 442.5	28	E35	C41	EE17	81:1	1.7 / 4.55	IP40	PLA	b	58							
31948603000	24	9 / 79.6	30	3	50 / 442.5	15	E35	C41	EE17	81:1	1.7 / 4.55	IP40	PLA	b	58							
31948622000	12	8 / 70.8	45	6	50 / 442.5	50	E35	C41	EE17	81:1	1.7 / 4.55	IP40	PLA	b	60							
31948623000	24	9 / 79.6	45	3	60 / 531	25	E35	C41	EE17	81:1	1.7 / 4.55	IP40	PLA	b	61							

Dimensions (mm/in)



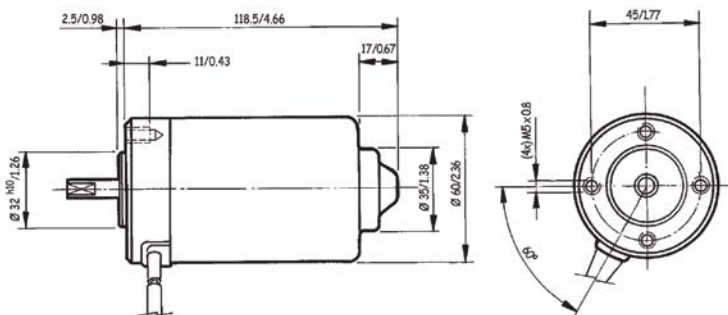
DOGA



162 Series Motor

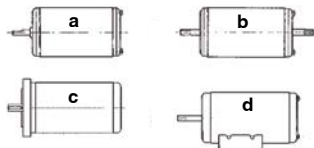
Part No.	Nominal Voltage	Nominal Torque	Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Approximate weight	Water tightness	Design: a, b	Curve
	Un (V)	Mn (N.m./ lbf.in)	nn (r.p.m)	In (A)	Ma (N.m./Lbf.in)	Ia (A)				P (kg / lb.t)	IP		
16241012000	12	0.18 / 1.59	2800	7.5	1.0 / 8.85	33	E2	C2	EE2	1.1 / 2.95	IP53	a	32
16241013000	24	0.20 / 1.77	3000	4	1.0 / 8.85	18	E2	C2	EE2	1.1 / 2.95	IP53	a	33
16241022000	12	0.20 / 1.77	2000	6	1.0 / 8.85	24	E2	C3	EE2	1.1 / 2.95	IP53	a	34
16241023000	24	0.20 / 1.77	2000	3	1.0 / 8.85	12	E2	C3	EE2	1.1 / 2.95	IP53	a	34
16241062000	12	0.18 / 1.59	2800	7.5	1.0 / 8.85	33	E4	C2	EE2	1.1 / 2.95	IP53	a	32
16241063000	24	0.20 / 1.77	3000	4	1.0 / 8.85	18	E4	C2	EE2	1.1 / 2.95	IP53	a	33
16241073000E	24	0.20 / 1.77	2000	3	1.0 / 8.85	12	E5	C5	F3	1.1 / 2.95	IP53	a	34
16241083000	24	0.18 / 1.59	1500	2.5	0.8 / 7.08	8.5	E2	C3	EE2	1.1 / 2.95	IP53	a	35
16241093000	24	0.18 / 1.59	1500	2.5	0.8 / 7.08	8.5	E38	C35	EE3	1.1 / 2.95	IP53	a	35
16241095000	48	0.18 / 1.59	1500	1.3	0.8 / 7.08	4.5	E38	C35	EE3	1.1 / 2.95	IP53	a	35
16241133000	24	0.12 / 1.06	3000	2.5	1.0 / 8.85	15	E3	C4	F3	1.1 / 2.95	IP40	a	36
16241163000	24	0.20 / 1.77	3000	4	1.0 / 8.85	18	E58/E57	C2	EE2	1.1 / 2.95	IP40	b	33

Dimensions (mm/in)



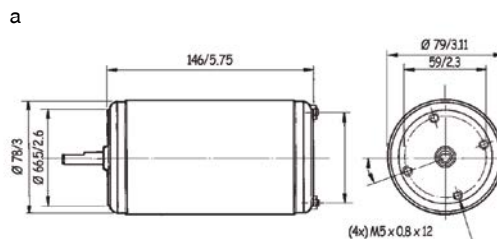
168 Series Motor (continued over page)

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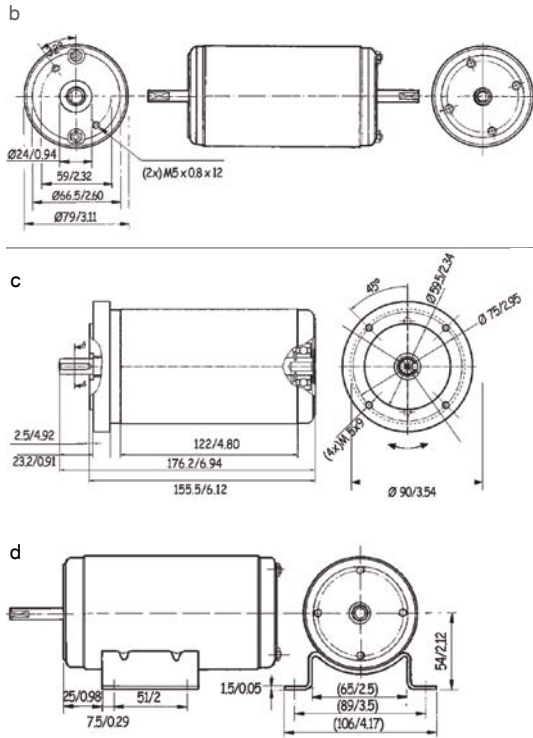
Part No.	Nominal Voltage	Nominal Torque	Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Approximate weight	Water tightness	Design: a, b, c, d	Curve
	Un (V)	Mn (N.m./ lbf.in)	nn (r.p.m)	In (A)	Ma (N.m./Lbf.in)	Ia (A)				P (kg / lb.t)	IP		
16841052004	12	0.50 / 4.42	1900	14	3.0 / 26.5	64	E8	C8	EE1	2.6 / 6.9	IP40	a	37
16841053004	24	0.50 / 4.42	1900	7	3.0 / 26.5	32	E8	C8	EE1	2.6 / 6.9	IP40	a	37
16841082004	12	0.45 / 3.98	2800	19	3.0 / 26.5	100	E9	C9	EE4	2.6 / 6.9	IP40	a	39
16841083004	24	0.45 / 3.98	2800	10	3.0 / 26.5	52	E9	C9	EE4	2.6 / 6.9	IP40	a	39
16841112004	12	0.75 / 6.64	1000	11	2.8 / 24.8	36	E11	C9	EE2	2.6 / 6.9	IP40	a	40
16841113004	24	0.75 / 6.64	1000	5.5	2.8 / 24.8	18	E11	C9	EE2	2.6 / 6.9	IP40	a	40
16841122004	12	0.70 / 6.19	1500	14	3.0 / 26.5	56	E12	C11	EE2	2.6 / 6.9	IP40	a	42
16841123004	24	0.70 / 6.19	1500	7	3.0 / 26.5	28	E12	C11	EE2	2.6 / 6.9	IP40	a	42
16841153004	24	0.50 / 4.42	3000	11	3.0 / 26.5	70	E13/E41	C13	EE2	2.6 / 6.9	IP40	a	41
16841162004	12	0.50 / 4.42	1900	14	3.0 / 26.5	64	E8	C8	EE1	2.6 / 6.9	IP40	d	37
16841163004	24	0.50 / 4.42	1900	7	3.0 / 26.5	32	E8	C8	EE1	2.6 / 6.9	IP40	d	37
1684121004E	24	0.50 / 4.42	3000	11	3.0 / 26.5	70	E11/E11	C13	F2	2.6 / 6.9	IP40	b	41
16841223004	24	0.75 / 6.64	1000	5.5	2.8 / 24.8	18	E13/E41	C13	EE2	2.6 / 6.9	IP40	a	40
16841232004	12	0.50 / 4.42	2100	16	3.0 / 26.5	76	E13/E41	C13	EE2	2.6 / 6.9	IP40	a	43
16841233004	24	0.50 / 4.42	2100	8	3.0 / 26.5	38	E13/E41	C13	EE2	2.6 / 6.9	IP40	a	43
16841343004	24	0.30 / 2.65	750	1.5	1.5 / 13.3	7	E59	C9	EE2	2.6 / 6.9	IP40	a	44
16841363B00E	24	0.75 / 6.64	1000	5.5	2.8 / 24.8	18	E63	C42	F2	2.6 / 6.9	IP40	c	40

Dimensions (mm/in)



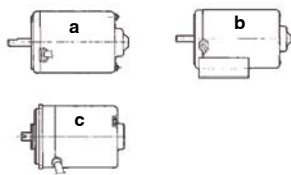
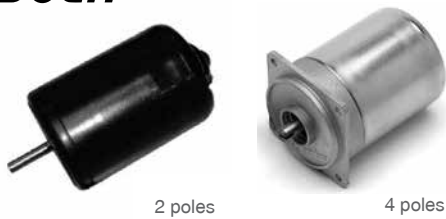
168 Series Motor (continued)

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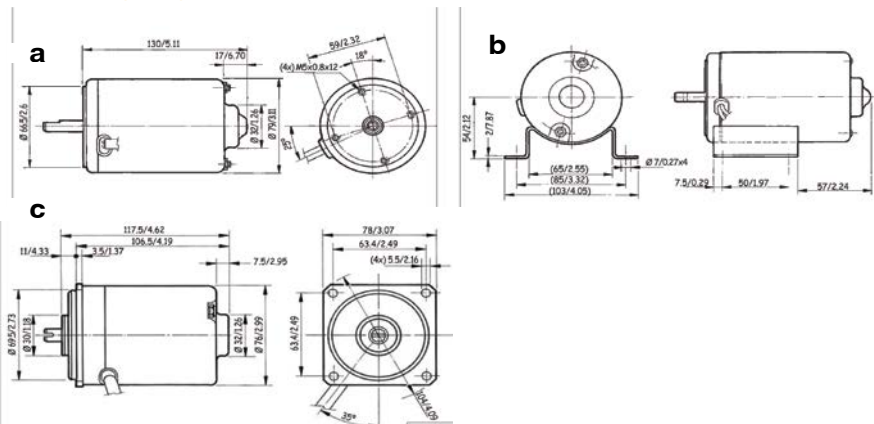
169 Series Motor

DOGA



Part No.	Nominal Voltage (V)	Nominal Torque (N.m/ lbf.in)	Nominal speed (r.p.m)	Nominal current (A)	Starting torque (N.m./Lbf.in)	Starting Current Ia (A)	Shaft	Connections	Wiring diag.	Approximate weight P (kg / lb.t)	Water tightness IP	Design: a, b, c	Curve
16941062004	12	0.40 / 3.54	1900	11	2.0 / 17.7	46	E14	C14	EE2	2.0 / 5.35	IP53	a	45
16941063004	24	0.40 / 3.54	1900	5.5	2.0 / 17.7	23	E14	C14	EE2	2.0 / 5.35	IP53	a	45
16941072004	12	0.40 / 3.54	2900	16	2.2 / 19.4	100	E15	C15	EE2	2.0 / 5.35	IP53	a	46
16941073004	24	0.40 / 3.54	2900	8	2.2 / 19.4	50	E15	C15	EE2	2.0 / 5.35	IP53	a	46
16941102004	12	0.40 / 3.54	1500	9	2.0 / 17.7	38	E16	C16	EE6	2.0 / 5.35	IP53	a	47
16941103004	24	0.40 / 3.54	1500	4.5	2.0 / 17.7	19	E16	C16	EE6	2.0 / 5.35	IP53	a	47
16941132009	12	0.40 / 3.54	3200	16	2.2 / 19.4	85	E18	C18	EE8	1.37 / 3.67	IP53	c	48
16941133009	24	0.40 / 3.54	3200	8	2.2 / 19.4	43	E18	C18	EE8	1.37 / 3.67	IP53	c	48
16941172004	12	0.40 / 3.54	1500	9	2.0 / 17.7	38	E47	C36	EE1	2.0 / 5.35	IP53	b	47
16941222009	12	0.30 / 2.65	4600	16	1.8 / 15.9	100	E18	C18	EE8	1.37 / 3.67	IP53	c	49
16941242004	12	0.40 / 3.54	1900	11	2.0 / 17.7	46	E60	C14	EE2	2.0 / 5.35	IP53	b	45
16941243004	24	0.40 / 3.54	1900	5.5	2.0 / 17.7	23	E60	C14	EE2	2.0 / 5.35	IP53	b	45

Dimensions (mm/in)



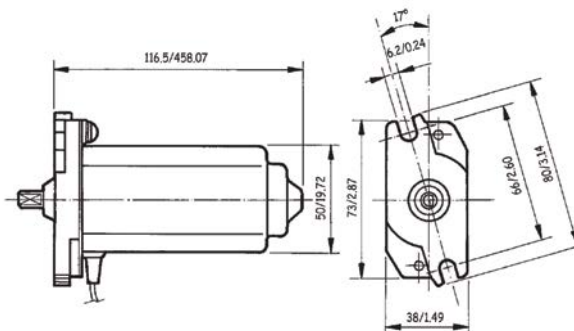
260 Series Motor

DOGA



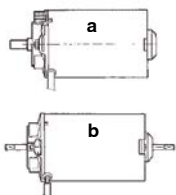
Part No.	Nominal Voltage	Nominal Torque	Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Approximate weight	Water tightness	Curve
	Un (V)	Mn (N.m./ lbf.in)	nn (r.p.m)	In (A)	Ma (N.m./Lbf.in)	la (A)							P (kg / lb.t)	IP
26001073000	24	0.08 / 0.70	4000	3	0.04 / 3.54	12	E19	C19	EE9	0.7 / 1.87	IP40	51
26001082000	12	0.08 / 0.70	4000	6	0.04 / 3.54	24	E19	C20	EE9	0.7 / 1.87	IP40	51
26001112004	12	0.08 / 0.70	3000	5	0.04 / 3.54	22	E19	C21	EE2	0.7 / 1.87	IP40	50
26001113004	24	0.08 / 0.70	3000	2.5	0.04 / 3.54	11	E19	C21	EE2	0.7 / 1.87	IP40	50

Dimensions (mm/in)



269 Series Motor

DOGA



Part No.	Nominal Voltage	Nominal Torque	Nominal speed	Nominal current	Starting torque	Starting Current	Shaft	Connections	Wiring diag.	Approximate weight	Water tightness	Design a, b	Curve
	Un (V)	Mn (N.m./ lbf.in)	nn (r.p.m)	In (A)	Ma (N.m./Lbf.in)	la (A)								P (kg / lb.t)	IP
26941022004	12	0.50 / 4.42	3000	20	4 / 35.4	140	E20	C22	EE2	3.8 / 10.18	IP53	a	52
26941023004	24	0.75 / 6.63	3000	15	4 / 35.4	120	E20	C22	EE2	3.8 / 10.18	IP53	a	53
26941032004	12	0.50 / 4.42	3000	20	4 / 35.4	140	E21	C23	EE2	3.8 / 10.18	IP53	a	52
26941033004	24	0.75 / 6.63	3000	15	4 / 35.4	120	E21	C23	EE2	3.8 / 10.18	IP53	a	53
26941042004	12	0.80 / 7.08	1800	20	4 / 35.4	100	E48	C24	EE2	3.8 / 10.18	IP53	a	54
26941043004	24	0.80 / 7.08	1800	10	4 / 35.4	50	E48	C24	EE2	3.8 / 10.18	IP53	a	54
26941062004	12	0.80 / 7.08	1800	20	4 / 35.4	100	E21	C23	EE2	3.8 / 10.18	IP53	a	54
26941063004	24	0.80 / 7.08	1800	10	4 / 35.4	50	E21	C23	EE2	3.8 / 10.18	IP53	a	54
26941073004E	24	0.75 / 6.63	3000	15	4 / 35.4	120	E48/E11	C22	F2	3.8 / 10.18	IP40	b	53
26941082004E	12	0.80 / 7.08	1800	20	4 / 35.4	100	E48/E11	C24	F2	3.8 / 10.18	IP40	b	54
26941133004	24	0.50 / 4.42	675	2.25	2.7 / 23.8	12	E48	C24	EE2	3.8 / 10.18	IP53	a	55

Dimensions (mm/in)

