SGM2 and SGM3 Fan Drive Gear Motors

Technical Information

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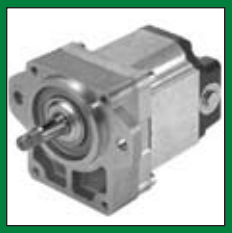


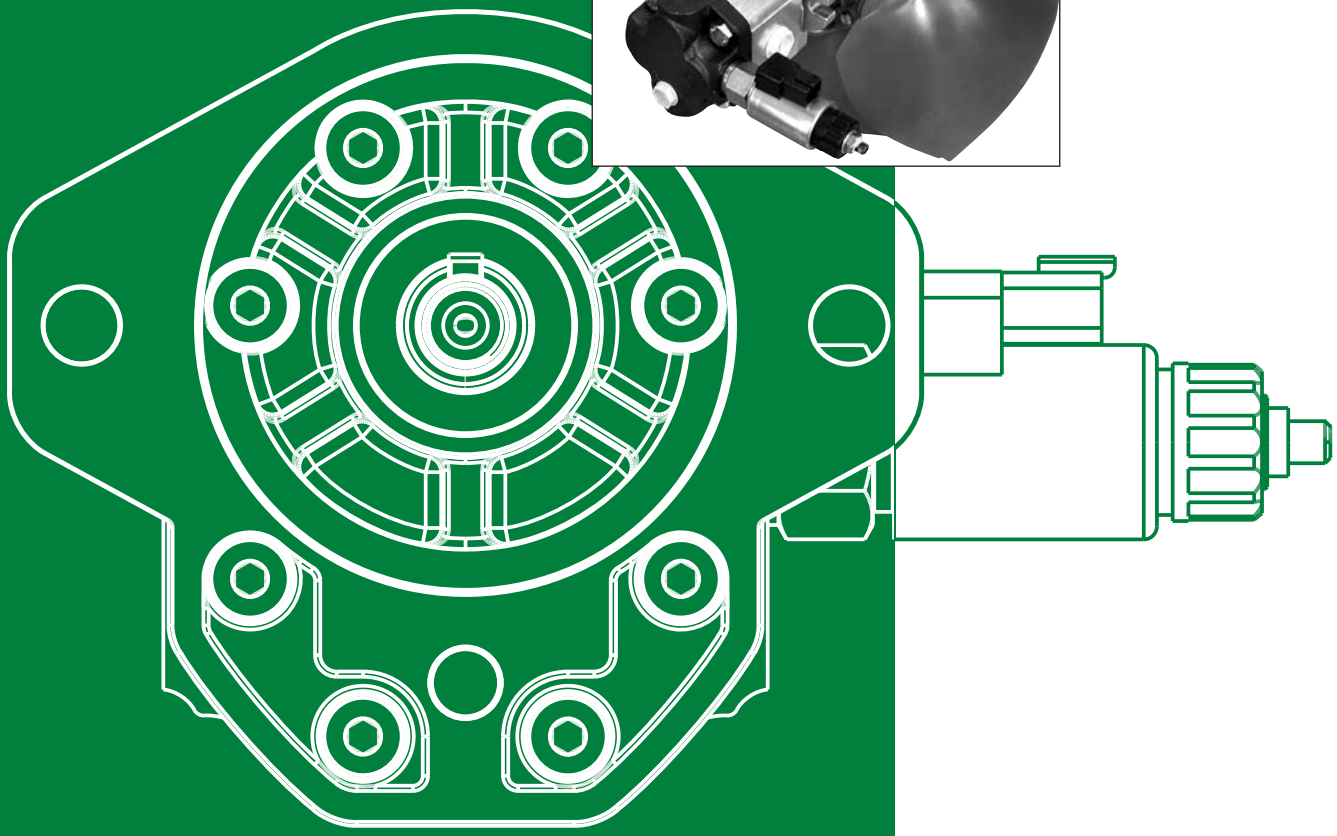

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History of revisions

Table of revisions

Date	Page	Changed	Rev.
28, June 2010	-	First edition	A

Reference documents

Literature reference for gear products

System component	Title	Type and order number
Pump	Cast Iron Hydraulic Gear Pumps Series D	Technical Information 520L0781
	Aluminium Gear Pumps Group 2	Technical Information L1016341
	Aluminium Gear Pumps Group 3	Technical Information L1016456
Valve	Proportional Solenoid Valves	Tech Note 11022746
	Solenoid Valves Product Electrical Installation	Tech Note 11022768
Fan drive control	Fan Drive Control	Technical Information 11005336
	Fan Drive Control Temperature Sensors	BLN-95-9063
	PLUS+1™	Datasheet 520L0719

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SGM2 and SGM3 Fan Drive Gear Motors
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Overview

Turolla OCG has over many years built up a wealth of experience with its hydraulic and electro-hydraulic fan drive systems for vehicles and machines operating both on and off highway. Modern fan drives require proportional electronic control to meet new emissions legislation. SGM2 and SGM3 fan drive motors are based on the proven high performance Turolla OCG gear motors.

A proportional pressure relief valve with pilot operated spool (normally closed) is integrated in the cast-iron rear cover of the motor. A gear pump supplies oil to the fan drive motor. The PWM signal to the solenoid pressure relief valve controls the oil flow through the motor which determines the fan speed. The fan speed is controlled to maintain optimum engine and hydraulic system temperatures. The SGM2YN, SGM3YN, SGM2VC and SGM3VC provide this proportional control in an integrated package within the rear cover.

Bi-directional fan motor capability is necessary when it is desired to switch the rotation of the fan blade for such reasons as cleaning debris from a radiator. This allows for more efficient cooling of the machine engine and functions. The SGM2NC and SGM3NC provide the bidirectional capability for use with remote, inline mounted HIC manifolds that provide the reversing flow. The SGM2VC and the SGM3VC integrate the reversing valve capability in the rear cover of the motor.

Due to the versatility, flexibility and reliability of Turolla OCG fan drive systems, they may be applied in numerous applications, such as:

- Agriculture machinery
- Construction machinery
- Material handling vehicles
- Road building vehicles
- Forestry machinery
- On-Highway vehicles

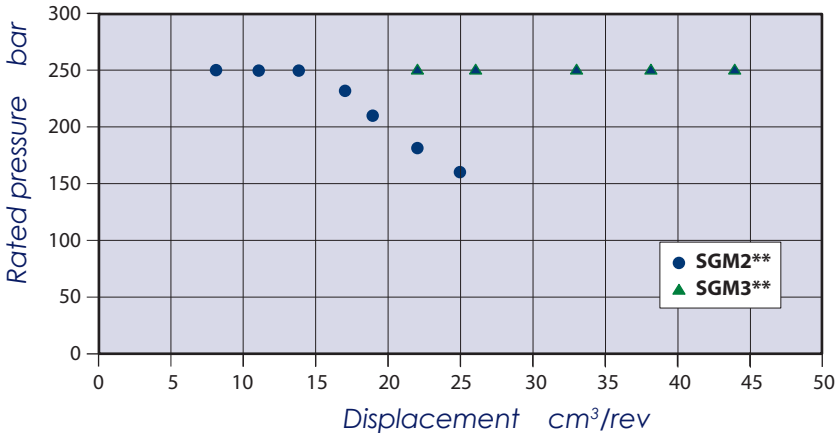
SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
General Information

Features and benefits

- Two groups of frame size (Group 2 and 3)
- Steel and cast iron rear covers for 250 bar (3626 psi) continuous performance and 270 bar [3916 psi] peak pressure for all port configurations
- Displacement from 8 to 44 cm^3/rev [from 0.51 to 2.69 in^3/rev]
- Maximum speed 3500 rpm for Group 2 and 2500 rpm for Group 3
- Extreme temperature seals for continuous operation from -20 °C [-4 °F] up to +95 °C [+203 °F], for today's more demanding applications.
- Two electro-hydraulic proportional valve options: PRV for standard fan speed modulation and optional flat curve valves for such applications as fan motors in series.
- Deutch Electrical connectors as standard to withstand dust and debris in the enviroN•ment.
- 12 V DC and 24 V DC coils.
- Fail safe function - full fan speed if electrical signal fails.
- Pressure settings factory pre-set for individual system performance.
- High efficiency gear motors to reduce system losses and retain useful hydraulic power work functions
- Outrigger bearings available for all 3 models to provide increased bearing capacity and therefore more durability or extended life in applications such as slewing, tracked machines, vibe and shock load applications that possess gyroscopic and impact loads or heavy steal fan blades.
- Shaft seal dust protector standard on all models for extended seal life in fan drive applications
- 2 Anti-Cavitation High Pressure Shock Valves, to clip pressure spikes in both directions of motor rotation, while reversing, where the competition uses only 1.
- Integrated Reversing Directional Control Valves with open spool transitions to reduce system pressure spikes.
- High performance valves and the use of steel / cast iron allows for full system pressure capability without de-rating the SGM product during reversing or proportional control.
- Feature for Feature industry leading short package to preserve much needed engine space: integrated valves packages and factory sealed outrigger bearings with high speed capability,
- PLUS+1 Compliant electronic interface allows for integration with PLUS+1 microcontrollers and other compliant products including sensors and graphical displays.

Fan drive motor displacements

Quick reference chart for fan drive motor models



Determination of nominal motor sizes

Use these formulas to determine the nominal motor size for a specific application.

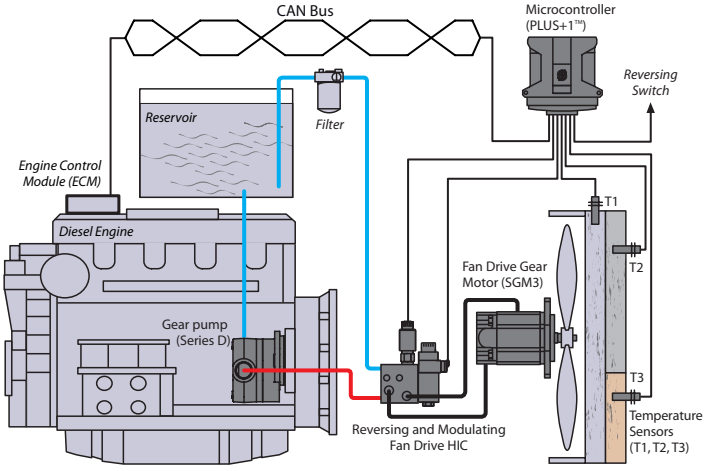
	Based on SI units	Based on US units
Input flow:	$Q = \frac{V_g \cdot n}{1000 \cdot \eta_v}$ l/min	$Q = \frac{V_g \cdot n}{231 \cdot \eta_v}$ [US gal/min]
Output torque:	$M = \frac{V_g \cdot \Delta p \cdot \eta_m}{20 \cdot \pi}$ N•m	$M = \frac{V_g \cdot \Delta p \cdot \eta_m}{2 \cdot \pi}$ [lbf•in]
Output power:	$P = \frac{M \cdot n}{9550} = \frac{Q \cdot \Delta p \cdot \eta_t}{600}$ kW	$P = \frac{M \cdot n}{63\,025} = \frac{Q \cdot \Delta p \cdot \eta_t}{1714}$ [hp]

Variables SI units [US units]

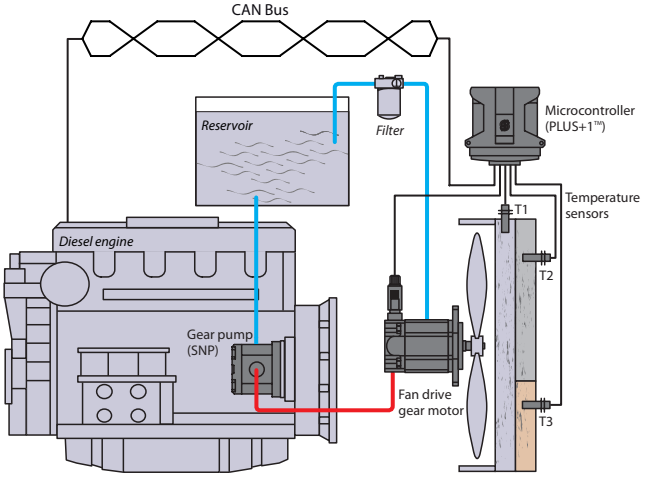
V_g	=	Displacement per revolution	cm^3/rev [in^3/rev]
p_o	=	Outlet pressure	bar [psi]
p_i	=	Inlet pressure	bar [psi]
Δp	=	$p_o - p_i$ (system pressure)	bar [psi]
n	=	Speed	min^{-1} (rpm)
η_v	=	Volumetric efficiency	
η_m	=	Mechanical efficiency	
η_t	=	Overall efficiency ($\eta_v \cdot \eta_m$)	

Fan drive motor circuit illustrations

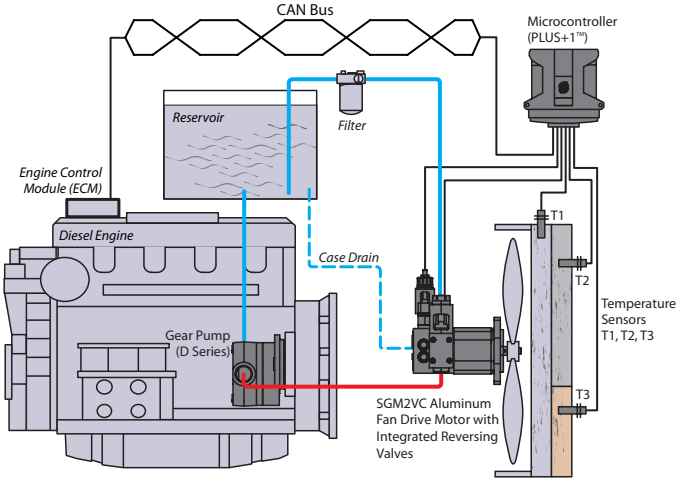
Gear pump/gear motor with HIC electrical control



Gear pump/gear motor with electro-proportional relief valve



Gear pump/gear motor with integrated reversing control valve

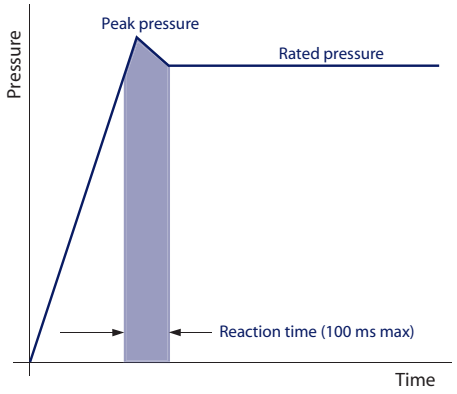


Pressure

Peak pressure is the highest intermittent pressure allowed. The relief valve overshoot (reaction time) determines peak pressure. It is assumed to occur for less than 100 ms. *The illustration to the right* shows peak pressure in relation to rated pressure and reaction time (100 ms maximum).

Rated pressure is the average, regularly occurring operating inlet pressure that should yield satisfactory product life. The maximum machine load at the motor shaft determines rated pressure.

Time versus pressure



System pressure is the differential between the inlet and outlet ports. It is a dominant operating variable affecting hydraulic unit life. High system pressure, resulting from high load at the motor shaft, reduces expected life. System pressure must remain at, or below, rated pressure during normal operation to achieve expected life.

Back pressure is the average, regularly occurring operating outlet pressure that should yield satisfactory motor life. The hydraulic load demand downstream of the motor determines the back pressure. The fan drive gear motor can work with back pressure and the maximum back pressure allowed is 60% of the maximum rated pressure.

Case drain pressure is the regularly occurring case drain line pressure that should yield satisfactory motor life. It is recommended to design the case drain piping connecting the case drain direct to the tank in order to keep the case drain pressure as low as possible. Max. continuous case drain pressure allowed is 5 bar [72.5 psi] with a peak of 7 bar [101.5 psi].

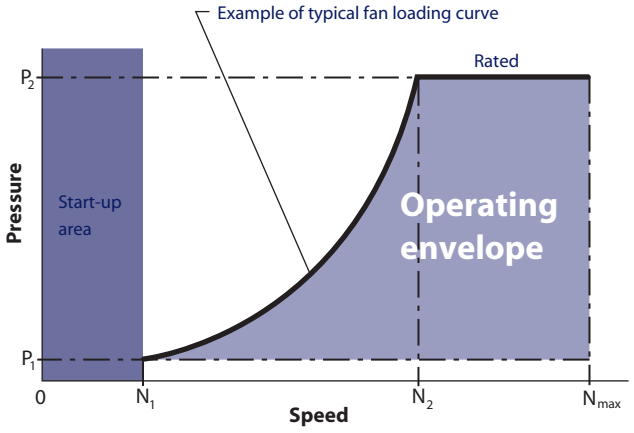
Speed

Maximum speed is the limit recommended by Turolla OCG for a particular gear motor when operating at rated pressure. It is the highest speed at which normal life can be expected. N2 is max speed related to the RV valve setting (p2) and type of fan.

The lower limit of operating speed is the **minimum speed**. It is the lowest speed at low pressure.

The minimum speed increases as operating system pressure increases. When operating under higher pressures, a higher minimum speed must be maintained, as illustrated to the right.

Speed versus pressure



Hydraulic fluids

Ratings and data for gear motors are based on operating with premium hydraulic fluids containing oxidation, rust, and foam inhibitors. These fluids must possess good thermal and hydrolytic stability to prevent wear, erosion, and corrosion of internal components.

Please see Turolla OCG publication *Hydraulic Fluids and Lubricants Technical Information,* ***520L0463*** for more information. Refer to publication *Experience with Biodegradable Hydraulic Fluids Technical Information,* ***520L0465*** for information relating to biodegradable fluids.

Use only clean fluid in the motor and hydraulic circuit.

Caution

Never mix hydraulic fluids.

Temperature and viscosity

Temperature and viscosity requirements must be concurrently satisfied.
Use petroleum/mineral-based fluids.

Temperature

High temperature limits apply at the inlet port of the motor. The motor should run at or below the maximum continuous temperature.

Cold oil, generally, doesn't affect the durability of motor components. It may affect the ability of oil to flow and transmit power. For this reason, keep the temperature at 16°C [60 °F] above the pour point of the hydraulic fluid.

Minimum (cold start) **temperature** relates to the physical properties of component materials.

Maximum continuous temperature allowed at which normal life can be expected.

Temperature

Minimum (cold start)	°C [°F]	-20 [-4]
Maximum continuous		95 [203]
Peak (intermittent)		110 [230]

Peak (intermittent) **temperature**: the overheating temperature that is tolerable by the machine for a transient/limited time.

Viscosity

Minimum viscosity occurs only during brief occasions of maximum ambient temperature and severe duty cycle operation. It's the minimum acceptable viscosity to allow normal motor life.

Maximum viscosity occurs only during cold start at very low ambient temperatures. It's the upper limit of viscosity that allows the motor to start.

Fluid viscosity

Maximum (cold start)	mm^2/s [SUS]	1600 [7273]
Recommended range		12–100 [66–456]
Minimum		10 [60]
Recommended range for high efficiency		20–50 [97–231]

Filtration

Filters

Use a filter that conforms to Class 22/18/13 of ISO 4406 (or better).
It may be on the motor outlet (discharge filtration) or inlet (pressure filtration).

Selecting a filter

When selecting a filter, please consider:

- contaminant ingression rate (determined by factors such as the number of actuators used in the system)
- generation of contaminants in the system
- required fluid cleanliness
- desired maintenance interval
- filtration requirements of other system components

Measure filter efficiency with a Beta ratio (β_x):

- for discharge filtration with controlled reservoir ingression, use a $\beta_{35-45} = 75$ filter
- for pressure filtration, use a filtration with an efficiency of $\beta_{10} = 75$

βx ratio is a measure of filter efficiency defined by ISO 4572. It is the ratio of the number of particles greater than a given diameter ("X" in microns) upstream of the filter to the number of these particles downstream of the filter.

Fluid cleanliness level and β_x ratio

Fluid cleanliness level (per ISO 4406)	Class 22/18/13 or better
β_x ratio (discharge filtration)	$\beta_{35-45} = 75$ and $\beta_{10} = 2$
β_x ratio (pressure filtration)	$\beta_{10} = 75$
Recommended inlet screen size	100 – 125 µm [0.0039 – 0.0049 in]

The filtration requirements for each system are unique. Evaluate filtration system capacity by monitoring and testing prototypes.

Reservoir

The **reservoir** provides clean fluid, dissipates heat, removes entrained air, and allows for fluid volume changes associated with fluid expansion and during all system operating modes. A correctly sized reservoir accommodates maximum volume changes during all system operating modes. It promotes de-aeration of the fluid as it passes through, and accommodates a fluid dwell-time between 60 and 180 seconds, allowing entrained air to escape.

Minimum reservoir capacity depends on the volume required to cool and hold the oil, allowing for expansion due to temperature changes. A fluid volume of one to three times the motor output flow (per minute) is satisfactory. The minimum recommended reservoir capacity is 125% of the fluid volume.

Put the return-line below the lowest expected fluid level to allow discharge into the reservoir for maximum dwell and efficient de-aeration. A baffle (or baffles) between the return and suction lines promotes de-aeration and reduces fluid surges.

Line sizing

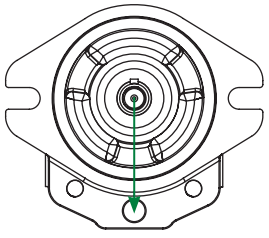
Choose pipe sizes that accommodate minimum fluid velocity to reduce system noise, pressure drops and overheating in order to maximize system life and performance. Line velocity should not exceed 5.0 m/s [16.4 ft/s]:

Most systems use hydraulic oil containing 10% dissolved air by volume. **Over-aeration**, or entrained air, is the result of flow line restrictions, where the dissolved air comes out of solution, or when air is allowed to leak into the hydraulic circuit. These include inadequate pipe sizes, sharp bends, or elbow fittings, causing a reduction of flow-line cross-sectional area. This problem will not occur if these circuit recommendations are followed, rated speed requirements are maintained, and reservoir size and location are adequate.

Motor shaft connection

Shaft options for fan drive gear motors include tapered (1:5 and 1:8) and parallel. Allowable **radial shaft loads** are a function of the load position, load orientation, and operating pressure of the hydraulic motor. All external shaft loads have an effect on bearing life, and may affect motor performance.

In applications where the external shaft loads cannot be avoided, minimize the impact on the motor by optimizing the orientation and the magnitude of the load. Turolla OCG fan drive gear motors are capable of carryng most manufaturer's plastic fans up to 7.27 kg (16 lb) fan blades for the Group 2 and 11.75 kg (26 lb) fan blades for the Group 3. For fan drives exceeding these loads, with presence of shock loads, or for slewing (swing) and oscilating applications such as Excavators, Wheel Loaders, Harvester, and Windrowers, please consult your Turolla OCG Technical Representative for the potential usage of an outrigger bearing.
See following drawing for fan drive mounting orientation to be considered.



Motor life is a function of speed, system pressure, and other system parameters (such as fluid quality and cleanliness).

Motor life

All Turolla OCG gear motors use hydrodynamic journal bearings that have an oil film maintained between the gear/shaft and bearing surfaces at all times. If the oil film is sufficiently sustained through proper system maintenance and operating within recommended limits, long life can be expected.

B_{10} life expectancy number is generally associated with rolling element bearings. It does not exist for hydrodynamic bearings.

High pressure impacts motor life. When submitting an application for review, provide machine duty cycle data that includes percentages of time at various loads and speeds. We strongly recommend a prototype testing program to verify operating parameters and their impact on life expectancy before finalizing any system design.

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
SGM2NC – Group 2 Fan Drive Gear Motors

Motor design

SGM2NC

SGM2NC is Group 2 bidirectional fan drive motor with inlet/outlet on cast iron rear cover and axial drain line

Displacement range from 8.4 cm^3/rev up to 25.2 cm^3/rev [from 0.51 up to 1.54 in^3/rev].

Configurations include European and SAE flanges; taper 1:8, taper 1:5 and parallel Ø15.875 mm [Dia 0,62 in] shafts.

Outrigger bearing available as SAE A flange with taper shaft 1:8 and European flange with taper shaft 1:5.

SGM2NC

Technical data

Technical data for SGM2NC standard fan drive gear motors

Frame size		8,0	011	014	017	019	022	025
Displacement	cm^3/rev [in^3/rev]	8.4 [0.51]	10.8 [0.66]	14.4 [0.88]	16.8 [1.03]	19.2 [1.17]	22.8 [1.39]	25.2 [1.54]
Peak pressure	bar [psi]	270 [3916]	270 [3916]	270 [3916]	250 [3626]	230 [3336]	200 [2900]	180 [2610]
Rated pressure		250 [3626]	250 [3626]	250 [3626]	230 [3336]	210 [3046]	180 [2610]	160 [2320]
Back pressure		250 [3626]	250 [3626]	250 [3626]	230 [3336]	210 [3046]	180 [2610]	160 [2320]
Maximum speed	min^{-1} (rpm)	3500	3500	3500	3500	3200	3200	3200
Minimum speed		700	700	700	500	500	500	500
Weight	kg [lb]	3.2 [7.05]	3.75 [8.26]	3.9 [8.60]	4.05 [8.93]	4.15 [9.15]	4.3 [9.48]	4.4 [9.70]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lbf•ft^2]	32.4 [769]	38.4 [911]	47.3 [1122]	53.3 [1265]	59.2 [1405]	68.1 [1616]	74.1 [1758]

Model code

A		B	C	D	E	F	G	H	I	J	K		L	M	N
S G M 2 N C	/		B	A			N N	N N	N N	N	N	/	N N N		

A Type

SGM2NC	Group 2 fan drive motor with cast iron rear cover, with inlet/outlet port ⅞–14UNF–2B, standard drain *(radial position)*

B Displacement

8,0	8.4 cm^3/rev [0.51 in^3/rev]
011	10.8 cm^3/rev [0.66 in^3/rev]
014	14.4 cm^3/rev [0.88 in^3/rev]
017	16.8 cm^3/rev [1.02 in^3/rev]
019	19.2 cm^3/rev [1.12 in^3/rev]
022	22.8 cm^3/rev [1.39 in^3/rev]
025	25.2 cm^3/rev [1.54 in^3/rev]

C Sense of rotation

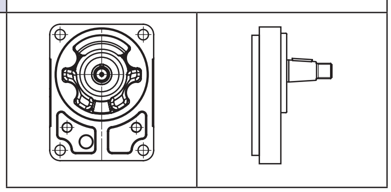
B	**B**idirectional

D Version

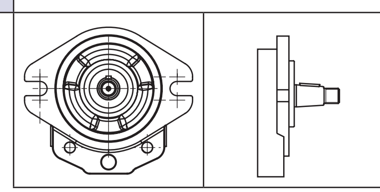
A	High temperature sealing Dust protector Rust protected screws

E Mounting flange and shaft

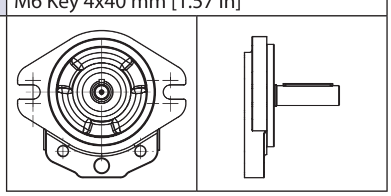
02AA	European 02 flange, pilot Ø 80 mm [Dia 3.15 in] 4-bolts - 1:5 Tapered shaft, Key 3 – M12 x 1.25



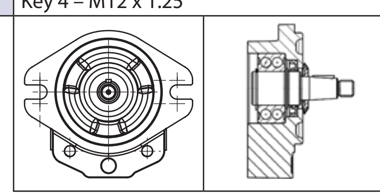
06BA	SAE A flange, pilot Ø 82.55 [Dia 3.25 in] 2-bolts - 1:8 Tapered shaft, Key 4 – M12 x 1.25



06GB	SAE A flange, pilot Ø 82.55 mm [Dia 3.25 in] 2-bolts- Ø 15.875 mm [Dia 0.625 in] Parallel shaft L=50.8 mm [2 in] thd hole M6 Key 4x40 mm [1.57 in]

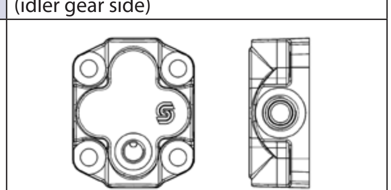


9YDB	Outrigger Bearing with dust cover - SAE A flange pilot Ø 82,55 [Dia 3.25 in] 2-bolts - 1:8 Tapered shaft, Key 4 – M12 x 1.25

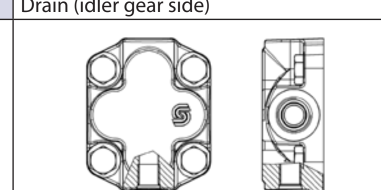


F Rear cover

C5	Cast Iron cover with 7/8 14 UNF-2B In-Out Ports - 9/16-18 UNF 2B Axial Drain (idler gear side)



CX	Cast Iron cover with 7/8 14 UNF-2B In-Out Ports - 9/16-18 UNF 2B Radial Drain (idler gear side)



G Inlet body port

NN	No inlet on body

H Outlet body port

NN	No outlet on body

Model code (continued)

A			B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	2	N	C	/				B	A					N	N	N	N	N	/	N	N	N		

I *Outlet port position, variant body*

NN	Standard

J *Sealing*

N	Standard high temperature seals

K *Screws*

N	Standard zinc plated screws

L *Valve*

NNN	No valve

M *Marking*

N	Standard marking
A	Standard + customer code
Z	Without marking
*****	Special customer marking

N *Mark position*

N	Standard marking position
A	Idler gear side

Mounting flange and shaft options

Turolla OCG offers two types of industry standard mounting flanges. *The table below* shows order codes for each available mounting flange and its intended use:

A			B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	2	N	C	/				B	A					N	N	N	N	N	/	N	N	N		

Shaft/Flange		Maximum torque	
Code	*Description*	**Code 02 flange**	**Code 06 flange**
02AA	European, pilot Ø 80 mm [Dia 3.15 in], 4-bolts Taper 1:5, Key 3 – M12 x 1.25	140 N•m [1239 lb•in]	–
06BA	SAE A, pilot Ø 82.55 mm [Dia 3.25 in], 2-bolts Taper 1:8, Key 4 – M12 x 1.25	–	150 N•m [1328 lb•in]
06GB	SAE A, pilot Ø 82.55 mm [Dia 3.25 in], 2-bolts Parallel Ø 15.875 [Dia 0.625], L 50.8 [2]	–	80 N•m [708 lb•in]

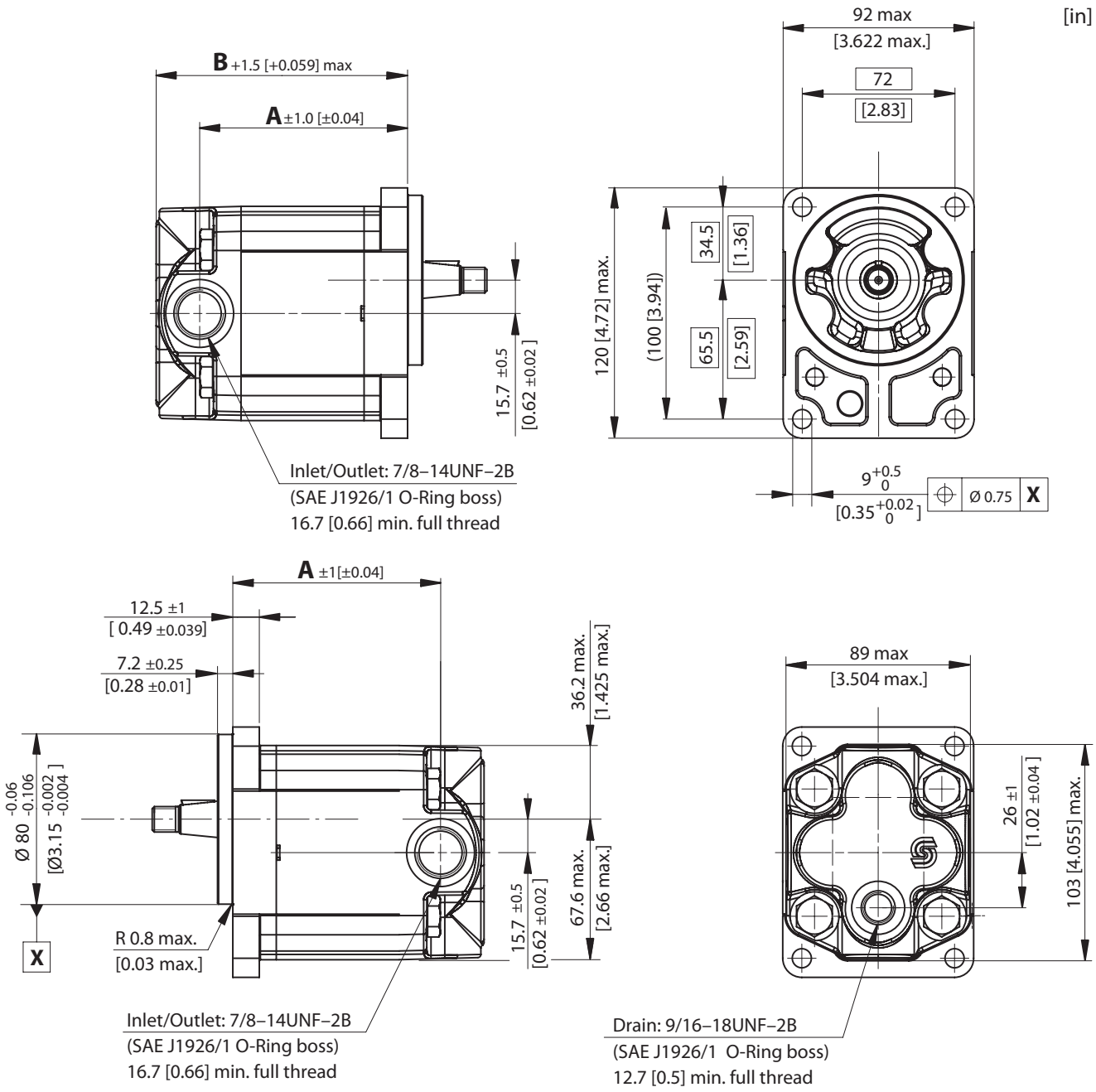
Spline configuration is not available for Group 2 fan drive motors. Other shaft options may exist. Contact your Turolla OCG representative for availability.

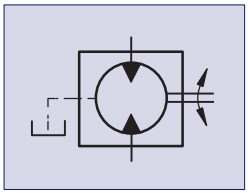
Caution

Shaft torque capability may limit allowable pressure. Torque ratings assume no external radial loading. Applied torque must not exceed these limits, regardless of stated pressure parameters. Maximum torque ratings are based on shaft torsional fatigue strength.

SGM2NC • 02AA dimensions

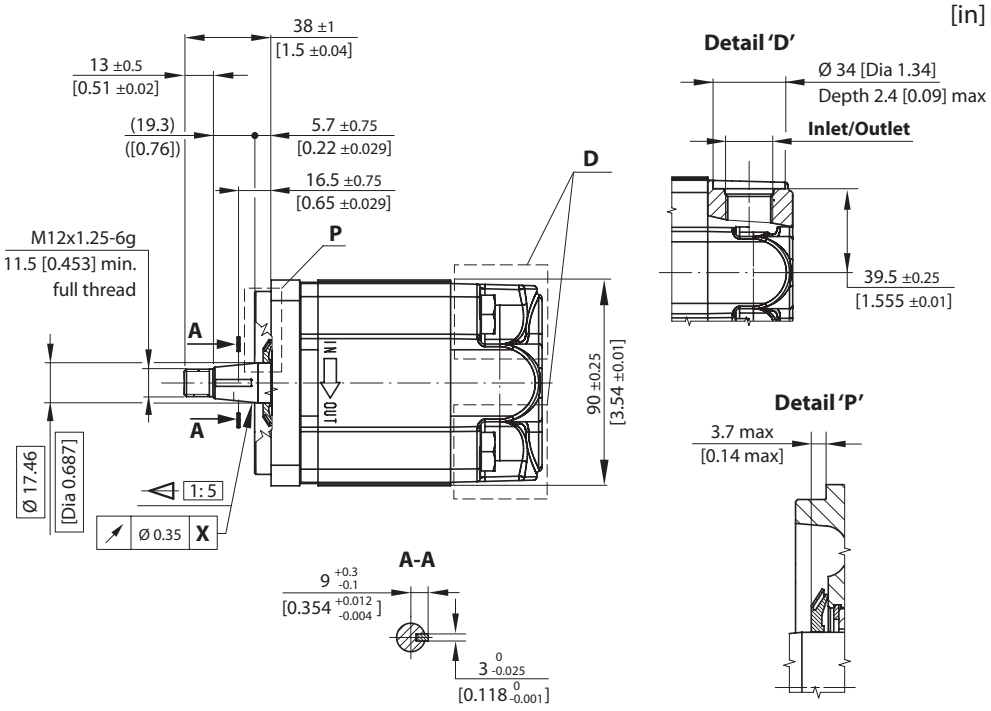
mm
[in]





SGM2NC • 02AA dimensions (continued)

mm
[in]



SGM2NC – 02AA dimensions

Frame size	8,0	011	014	017	019	022	025
A	98 [3.86]	102 [4.01]	108 [4.25]	112 [4.41]	116 [4.57]	122 [4.80]	126 [4.96]
B	118.5 [4.66]	122.5 [4.83]	128.5 [5.05]	132.5 [5.22]	136.5 [5.37]	142.5 [5.61]	146.5 [5.77]
Inlet/Outlet	7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Drain port	9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

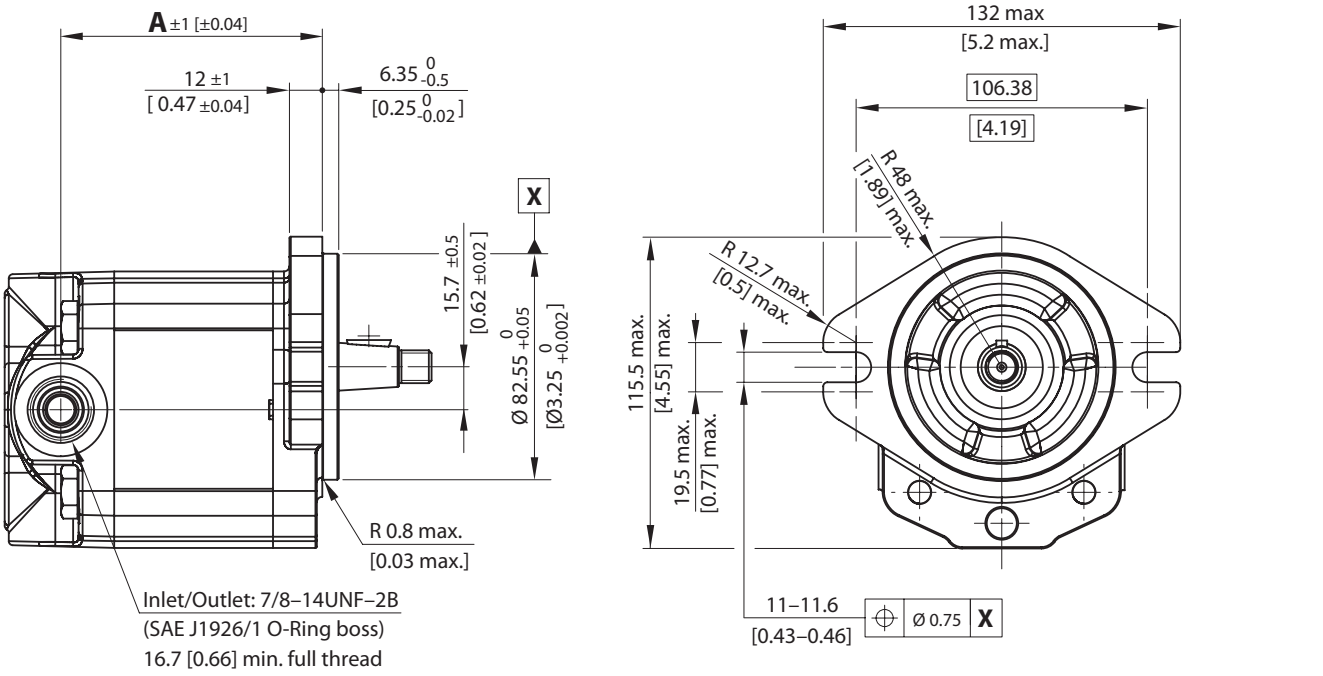
Model code example and maximum shaft torque

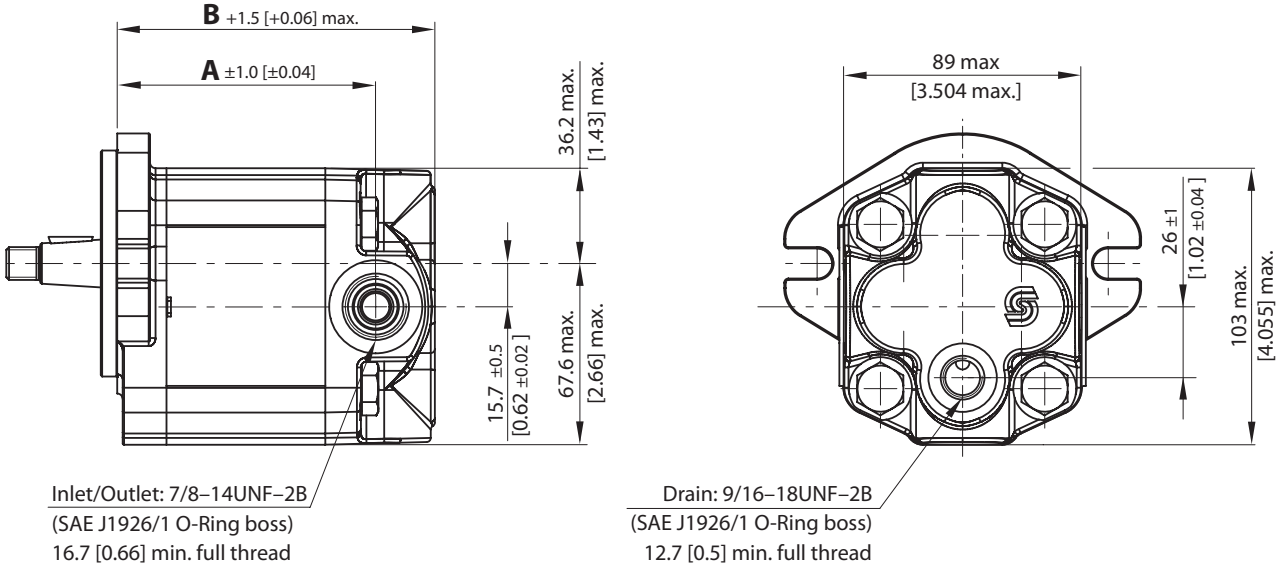
Flange/shaft	Model code example	Maximum shaft torque
02AA	SGM2NC/011BA02AAC5NNNNNNNN/NNNNN	140 N•m [1239 lb•in]

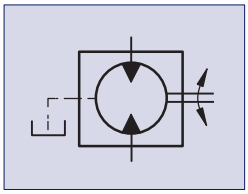
For further details on ordering, see *Model Code,* page 16 and 17.

SGM2NC • 06BA dimensions

mm
[in]

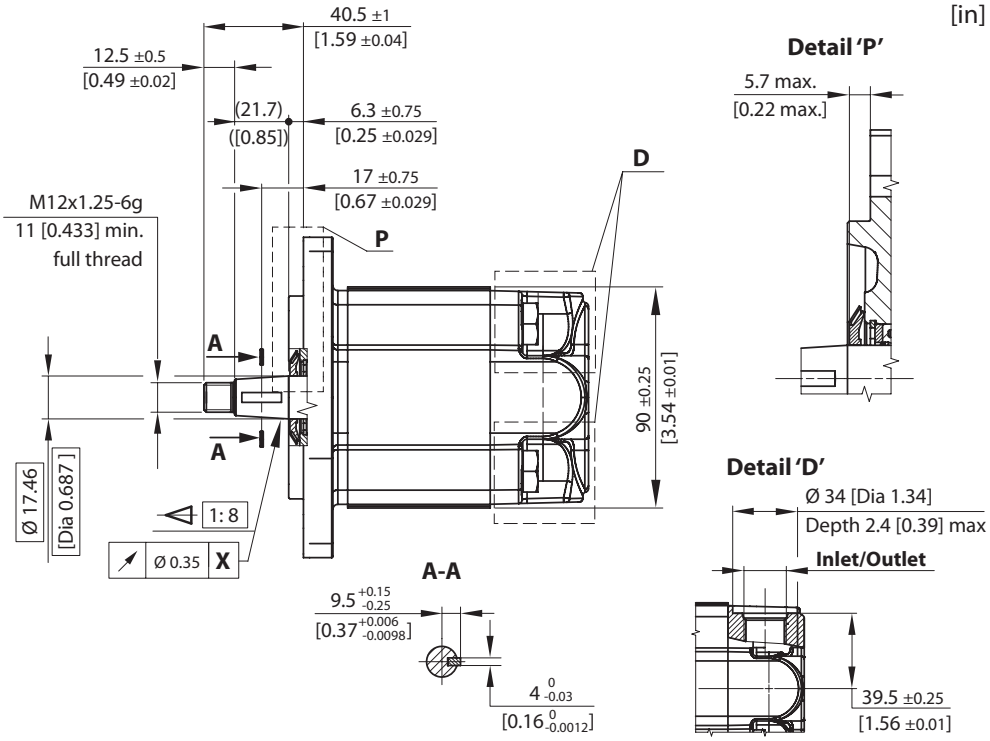






SGM2NC • 06BA dimensions (continued)

mm
[in]



SGM2NC – 06BA dimensions

Frame size	8,0	011	014	017	019	022	025
A	95.5 [3.76]	99.5 [3.92]	105.5 [4.15]	109.5 [4.31]	113.5 [4.47]	119.5 [4.70]	123.5 [4.86]
B	116 [4.57]	120 [4.72]	126 [4.96]	130 [5.11]	134 [5.28]	140 [5.51]	144 [5.67]
Inlet/Outlet	7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Drain port	9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

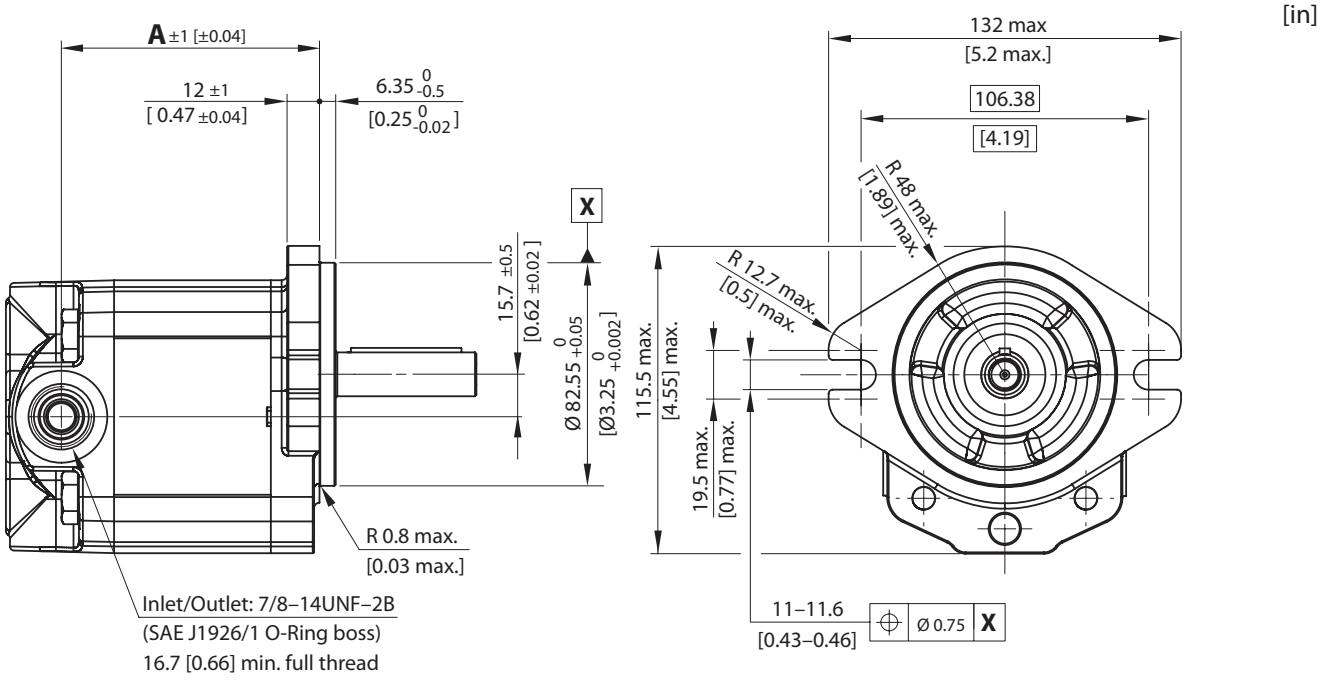
Model code example and maximum shaft torque

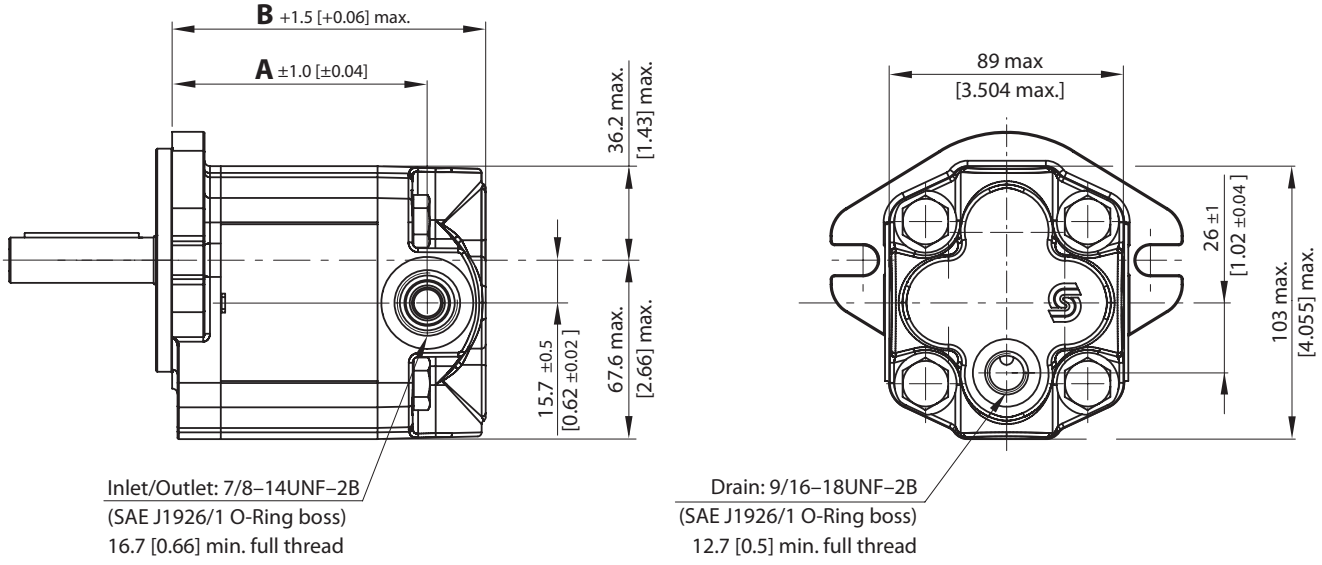
Flange/shaft	Model code example	Maximum shaft torque
06BA	SGM2NC/011BA06BAC5NNNNNNNN/NNNNN	150 N•m [1328 lb•in]

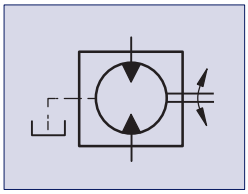
For further details on ordering, see *Model Code,* page 16 and 17.

SGM2NC • 06GB dimensions

mm
[in]

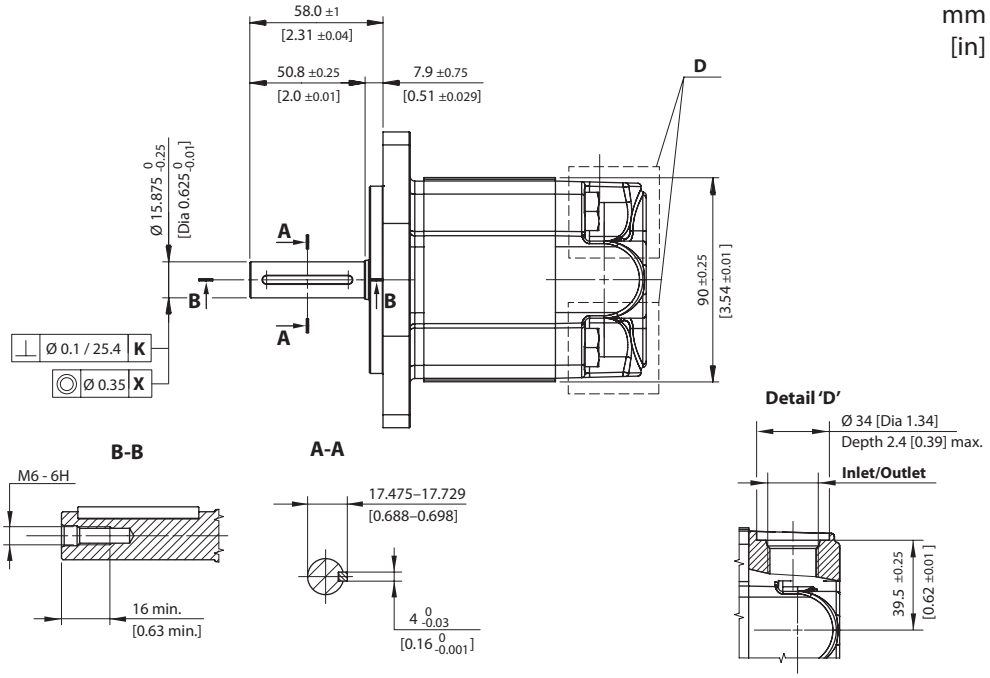






SGM2NC • 06GB dimensions (continued)

mm
[in]



SGM2NC – 06GB dimensions

Frame size	8,0	011	014	017	019	022	025
A	95.5 [3.76]	99.5 [3.92]	105.5 [4.15]	109.5 [4.31]	113.5 [4.47]	119.5 [4.70]	123.5 [4.86]
B	116 [4.57]	120 [4.72]	126 [4.96]	130 [5.11]	134 [5.28]	140 [5.51]	144 [5.67]
Inlet/Outlet	7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Drain port	9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

Model code example and maximum shaft torque

Flange/shaft	Model code example	Maximum shaft torque
06GB	SGM2NC/011BA06GBC5NNNNNNNN/NNNNN	80 N•m [708 lb•in]

For further details on ordering, see *Model Code,* page 16 and 17.

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
Group 2 Fan Drive Gear Motors – SGM2YN

Motor design

SGM2YN

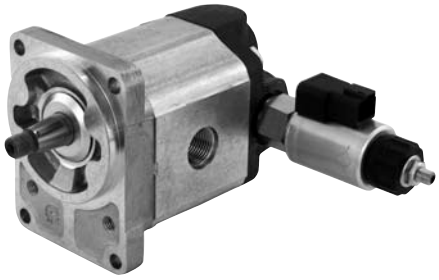
SGM2YN is Group 2 fan drive motor with inlet on rear cover and outlet on body.Integrated proportional relief valve, anti-cavitation check valve and axial drain line.

Displacement range from 8.4 cm^3/rev up to 25.2 cm^3/rev [from 0.51 up to 1.54 in^3/rev].

Configurations include European and SAE flanges; taper 1:8, taper 1:5 and parallel Ø15.875 mm [Dia 0,62 in] shafts.

Outrigger bearing available as SAE A flange with taper shaft 1:8 and European flange with taper shaft 1:5.

SGM2YN



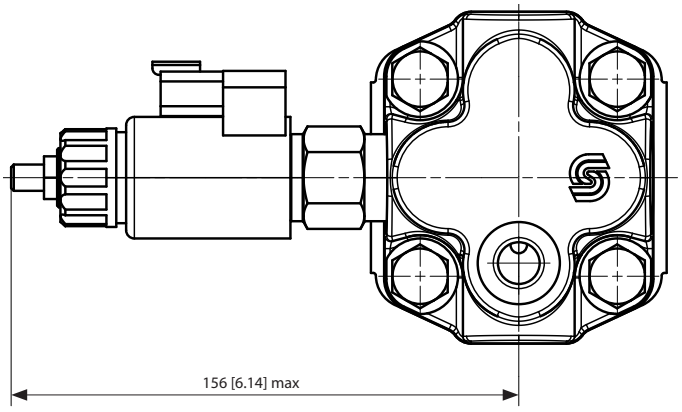
Technical data

Technical data for SGM2YN standard fan drive gear motors

Frame size		8,0	011	014	017	019	022	025
Displacement	cm^3/rev [in^3/rev]	8.4 [0.51]	10.8 [0.66]	14.4 [0.88]	16.8 [1.03]	19.2 [1.17]	22.8 [1.39]	25.2 [1.54]
Peak pressure	bar [psi]	270 [3916]	270 [3916]	270 [3916]	250 [3626]	230 [3336]	200 [2900]	180 [2610]
Rated pressure		250 [3626]	250 [3626]	250 [3626]	230 [3336]	210 [3046]	180 [2610]	160 [2320]
Back pressure		150 [2176]	150 [2176]	150 [2176]	150 [2176]	130 [1885]	100 [1450]	100 [1450]
Maximum speed	min^{-1} (rpm)	3500	3500	3500	3500	3200	3200	3200
Minimum speed		700	700	700	500	500	500	500
Weight	kg [lb]	4.73 [10.43]	4.83 [10.65]	5.03 [11.1]	5.18 [11.42]	5.23 [11.53]	5.33 [11.75]	5.53 [12.2]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lbf•ft^2]	32.4 [769]	38.4 [911]	47.3 [1122]	53.3 [1265]	59.2 [1405]	68.1 [1616]	74.1 [1758]

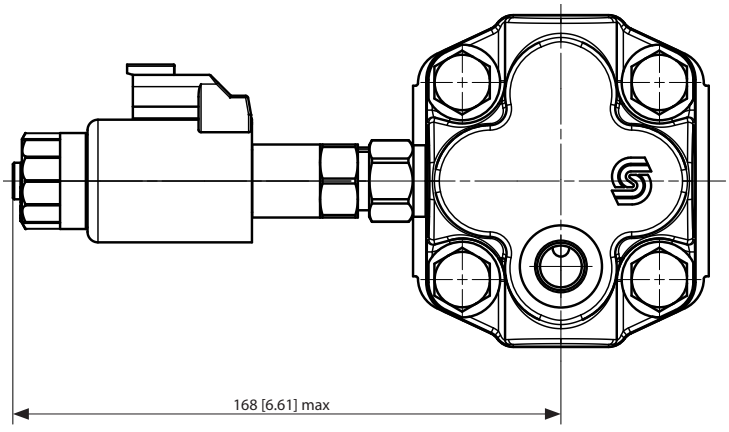
Technical data (continued)

Electro proportional relief valve standard



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 7.2 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 28.8 Ω @ 20 °C [68 °F]
PWM frequency	from 100 to 200 Hz

Electro proportional relief valve flat curve



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 6.4 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 26.2 Ω @ 20 °C [68 °F]
PWM frequency	from 100 to 250 Hz

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
SGM2YN – Group 2 Fan Drive Gear Motors

Model code

A			B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	2	Y	*	/																				
							A						N	N					N	N	/					

A *Type*

SGM2YN	Gr2 Fan Drive Motor with EH Proportional Pressure Control; Cast Iron cover-Inlet port 7/8-14 UNF on Cover-Axial Drain Line
SGM2YL	Gr2 Fan Drive Motor with EH Proportional Pressure Control; Cast Iron cover-Inlet port 7/8-14 UNF on Cover-Radial Drain Line

B *Displacement*

8,0	8.4 cm³/rev [0.51 in³/rev]
011	10.8 cm³/rev [0.66 in³/rev]
014	14.4 cm³/rev [0.88 in³/rev]
017	16.8 cm³/rev [1.02 in³/rev]
019	19.2 cm³/rev [1.12 in³/rev]
022	22.8 cm³/rev [1.39 in³/rev]
025	25.2 cm³/rev [1.54 in³/rev]

C *Sense of rotation*

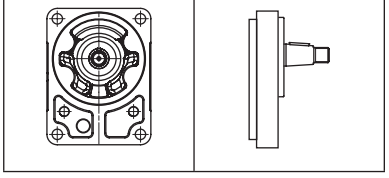
R	**R**ight (clockwise)
L	**L**eft (counterclockwise)

D *Version*

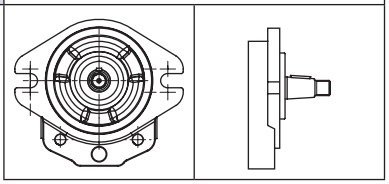
A	High-Temperature sealing Dust protector Galvanized screws

E *Mounting flange and shaft*

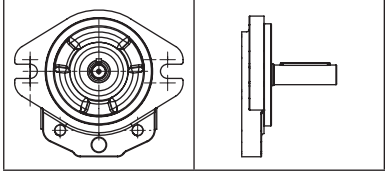
02AA	European 02 flange, pilot Ø 80 mm [Dia 3.15 in] 4-bolts - 1:5 Tapered shaft, Key 3 – M12 x 1.25



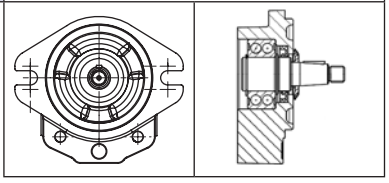
06BA	SAE A flange, pilot Ø 82.55 [Dia 3.25 in] 2-bolts - 1:8 Tapered shaft, Key 4 – M12 x 1.25



06GB	SAE A flange, pilot Ø 82.55 mm [Dia 3.25 in] 2-bolts- Ø 15.875 mm [Dia 0.625 in] Parallel shaft L=50.8 mm [2 in] thd hole M6 Key 4x40 mm [1.57 in]

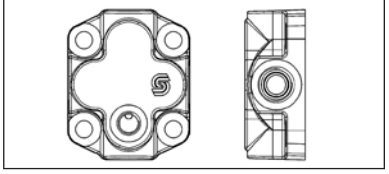


9YDB	Outrigger Bearing with dust cover - SAE A flange pilot Ø 82,55 [Dia 3.25 in] 2-bolts - 1:8 Tapered shaft, Key 4 – M12 x 1.25

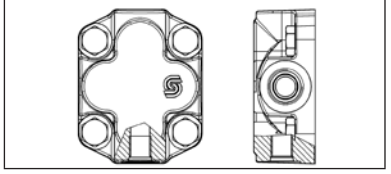


F *Rear cover*

Y6	Cast Iron cover with 7/8 14 UNF-2B In Port - 9/16-18 UNF 2B Axial Drain (idler gear side)



Y4	Cast Iron cover with 7/8 14 UNF-2B In Port - 9/16-18 UNF 2B Radial Drain (idler gear side)



Model code (continued)

A					B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	2	Y	*	/				A											N	N	/					

G *Inlet body port*

NN	No inlet in body

H *Outlet body port*

B5	15 x 35 x M6	Flanged port, 4-threaded holes in **X** pattern, (German standard)
B7	20 x 40 x M6	
C3	13.5 x 30 x M6	Flanged port, 4-threaded holes in **+** pattern, (European standard)
C7	20 x 40 x M8	
C8	23.5 x 40 x M8	
D7	M22 x 1.5	Threaded metric
D9	M26 x 1.5	
E5	7/8–14UNF	Threaded SAE, O-ring boss
E6	1–1/16–12UN	
F4	½ GAS	Threaded GAS (BSPP)
F5	¾ GAS	

I *Outlet port position and variant body*

NN	Standard motor - No outlet in body
YY	B5 or B7 with SAE-A flange off-set to rear cover
ZZ	B5 or B7 in the center of the body

J *Sealing*

N	Std High Temperature Seals

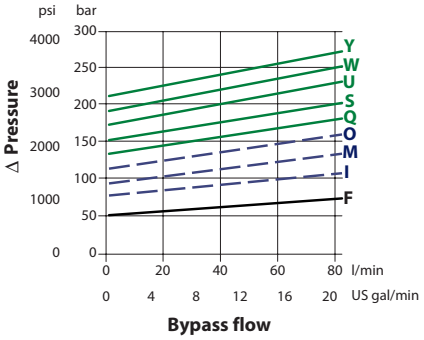
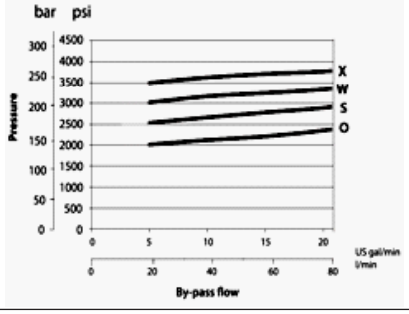
K *Screws*

N	Std Zinc Plated Screws

Model code (continued)

A					B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	2	Y	*	/			A						N	N					N	N	/					

L *Valve set*

XNN	No valve	
XA*	Standard relief valve with coil voltage 12 V DC, DT connector	
XB*	Standard relief valve with coil voltage 24 V DC, DT connector	
	X*F **X*I** **X*M** **X*O** **X*Q** **X*S** **X*U** **X*W** **X*Y**	Select Pressure vs. Bypass flow requirements using the graph below. Three color curves represent three types of valves. Each valve is characterized by different nominal spring ranges. 
SA*	Flat curve valve with coil voltage 12 V DC, DT connector	
SB*	Flat curve valve with coil voltage 24 V DC, DT connector	
	S*O **S*S** **S*W** **S*X** **S*W** **S*X**	

⚠ Caution

Maximum pressure setting will vary depending on pressure vs. bypass flow requirements.

M *Marking*

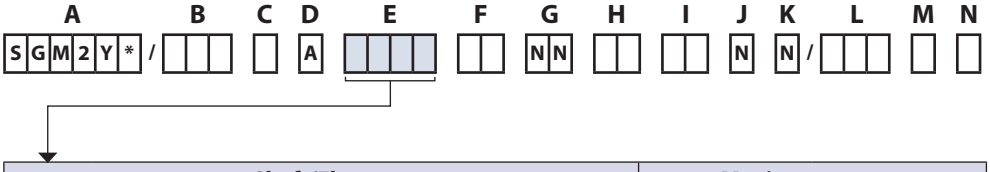
N	Standard marking
A	Standard + customer code
Z	Without marking
*	Special customer marking

N *Mark position*

N	Standard marking position
A	Idler gear side

Mounting flange and shaft options

Turolla OCG offers two types of industry standard mounting flanges. *The table below* shows order codes for each available mounting flange and its intended use:



Shaft/Flange		Maximum torque	
Code	*Description*	**Code 02 flange**	**Code 06 flange**
02AA	European, pilot Ø 80 mm [Dia 3.15 in], 4-bolts Taper 1:5, Key 3 – M12 x 1.25	140 N•m [1239 lb•in]	–
06BA	SAE A, pilot Ø 82.55 mm [Dia 3.25 in], 2-bolts Taper 1:8, Key 4 – M12 x 1.25	–	150 N•m [1328 lb•in]
06GB	SAE A, pilot Ø 82.55 mm [Dia 3.25 in], 2-bolts Parallel Ø 15.875 [Dia 0.625], L 50.8 [2]	–	80 N•m [708 lb•in]

Spline configuration is not available for Group 2 fan drive motors. Other shaft options may exist. Contact your Turolla OCG representative for availability.

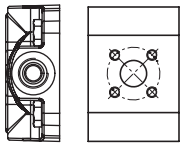
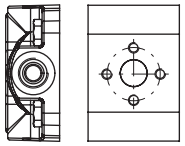
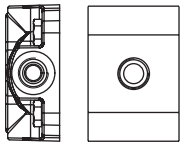
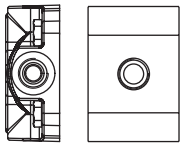
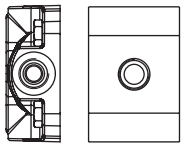
Caution

Shaft torque capability may limit allowable pressure. Torque ratings assume no external radial loading. Applied torque must not exceed these limits, regardless of stated pressure parameters. Maximum torque ratings are based on shaft torsional fatigue strength.

Outlet body ports configuration

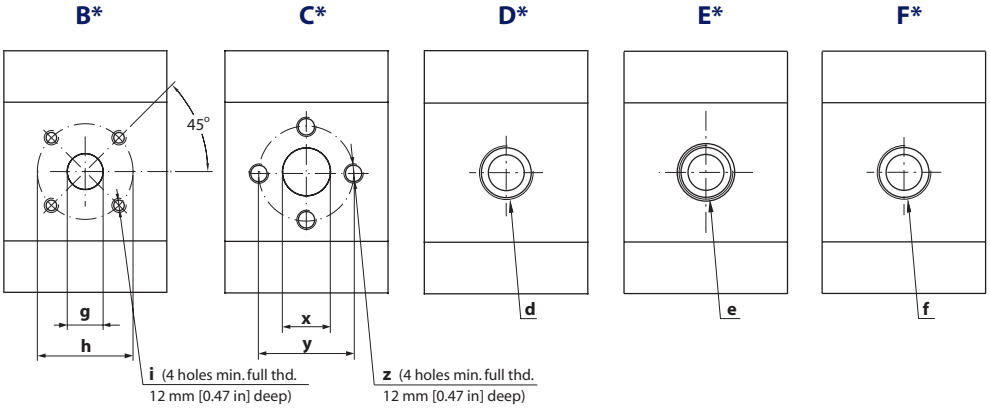
Turolla OCG offers two types of industry standard mounting flanges. *The table below* shows order codes for each available outlet body ports and its intended use:

Standard port configurations availability

Code	*Outlet body description*	*Standard on flange/shaft*	*Inlet/Outlet port design*
B5	Flanged 15 x 35 x M6 in × pattern (German standard ports)	02AA	
B7	Flanged 20 x 40 x M6 in × pattern (German standard ports)		
C3	Flanged 15 x 30 x M6 in + pattern (European standard ports)	Non-standard	
C7	Flanged 20 x 40 x M8 in + pattern (European standard ports)		
C8	Flanged 23 x 40 x M8 in + pattern (European standard ports)		
D7	Threaded metric M22 x 1.5	Non-standard	
D9	Threaded metric M26 x 1.5		
E5	SAE, O-ring boss 7/8–14UNF	06BA 06GB 9YDB	
E6	SAE, O-ring boss 1–1/16–12UN		
F4	Threaded ½ GAS (BSPP)	Non-standard	
F5	Threaded ¾ GAS (BSPP)		

Outlet body port dimension

Available ports for Group 2 fan drive motors



Group 2 fan drive motors ports dimensions (standard)

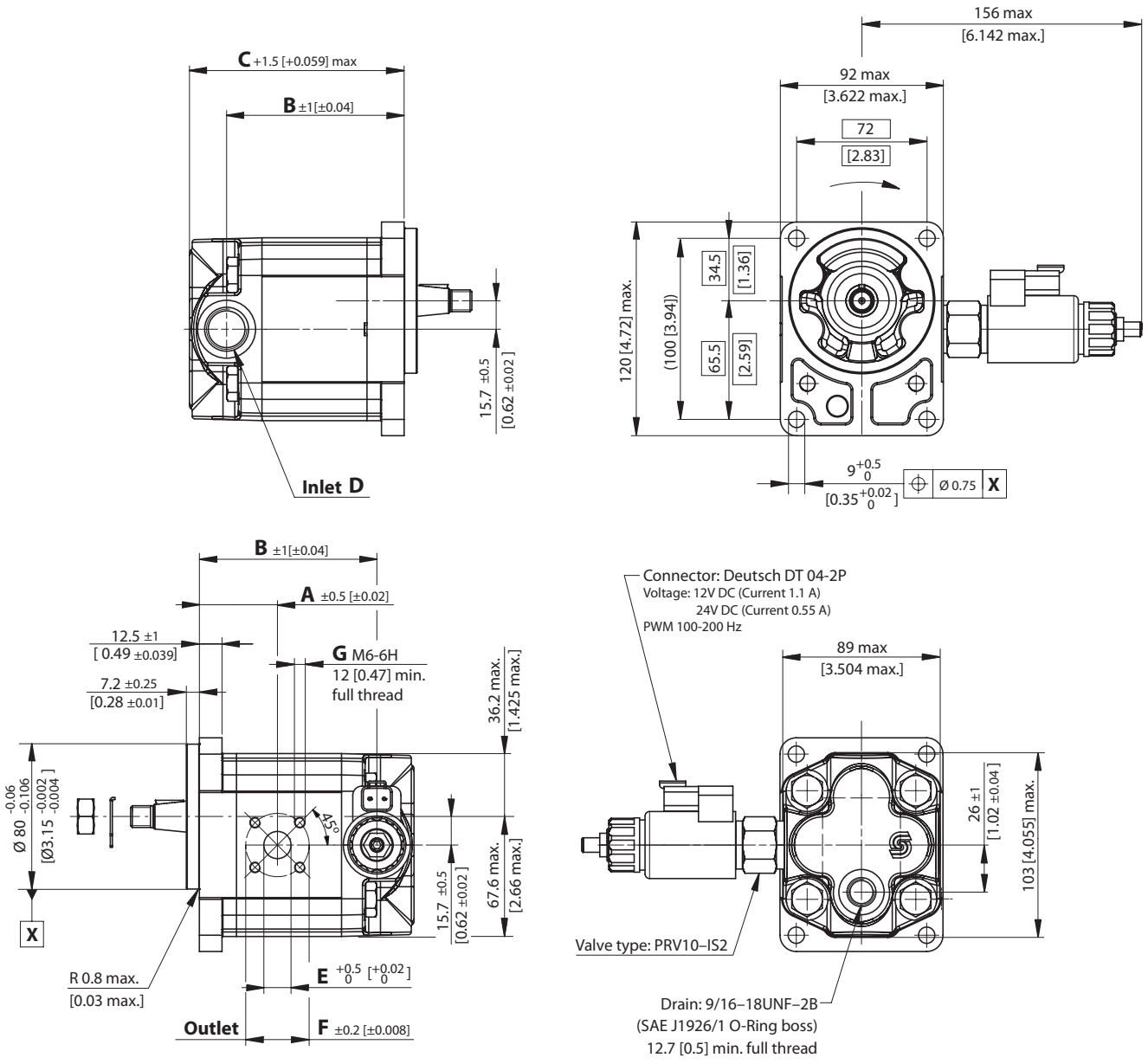
Standard outlet body port									
Port dimensions		B* for 02AA flange/shaft code					E* for 06BA, 06GB flange/shaft code		
				g	h	i			e
Frame size	8,0	Outlet port options	B5	15 [0.591]	35 [1.378]	M6	Outlet port options	E5	7/8–14 UNF
	011		B5	15 [0.591]	35 [1.378]			E5	7/8–14 UNF
	014		B5	15 [0.591]	35 [1.378]			E5	7/8–14 UNF
	017		B5	15 [0.591]	35 [1.378]			E5	7/8–14 UNF
	019		B7	20 [0.787]	40 [1.575]			E6	1–1/16–12 UN
	022		B7	20 [0.787]	40 [1.575]			E6	1–1/16–12 UN
	025		B7	20 [0.787]	40 [1.575]			E6	1–1/16–12 UN

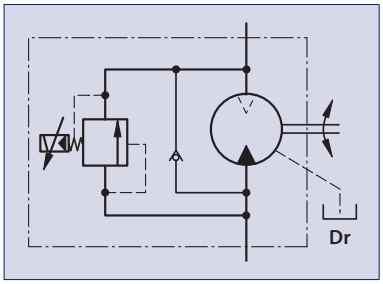
Group 2 fan drive motors ports dimensions (non-standard)

Non-standard outlet port											
Port dimensions		C*					D*			F*	
				x	y	z			d		f
Frame size	8,0	Outlet port options	C3	13.5 [0.531]	30 [1.181]	M6	Outlet port options	D7	M22x1.5	Outlet port options	F4 ½ Gas (BSPP)
	011		C3	13.5 [0.531]	30 [1.181]	M6		D7	M22x1.5		F4 ½ Gas (BSPP)
	014		C7	20 [0.787]	40 [1.575]	M8		D7	M22x1.5		F4 ½ Gas (BSPP)
	017		C7	20 [0.787]	40 [1.575]	M8		D7	M22x1.5		F4 ½ Gas (BSPP)
	019		C7	20 [0.787]	40 [1.575]	M8		D9	M26x1.5		F5 ¾ Gas (BSPP)
	022		C7	20 [0.787]	40 [1.575]	M8		D9	M26x1.5		F5 ¾ Gas (BSPP)
	025		C8	23.5 [0.925]	40 [1.575]	M8		D9	M26x1.5		F5 ¾ Gas (BSPP)

SGM2YN • 02AA dimensions

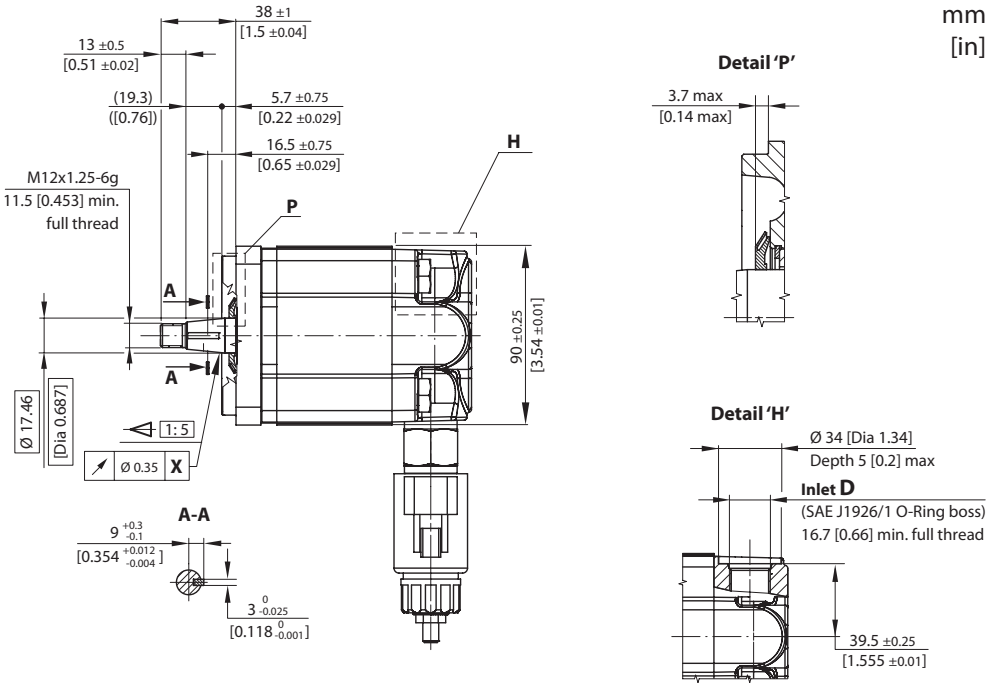
mm
[in]





SGM2YN • 02AA dimensions (continued)

mm
[in]



SGM2YN – 02AA dimensions

Frame size		8,0	011	014	017	019	022	025
Dimension	A	43.1 [1.70]	47.5 [1.87]	47.5 [1.87]	47.5 [1.87]	47.5 [1.87]	55.0 [2.17]	64.5 [2.54]
	B	98 [3.86]	102 [4.01]	108 [4.25]	112 [4.41]	116 [4.57]	122 [4.80]	126 [4.96]
	C	118.5 [4.66]	122.5 [4.83]	128.5 [5.05]	132.5 [5.22]	136.5 [5.37]	142.5 [5.61]	146.5 [5.77]
Inlet	D	7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Outlet	E	15 [0.59]		20 [0.79]				
	F	35 [0.38]		40 [0.57]				
	G	M6–6H; 12 [0.47] min. full thread						
Drain port		9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

Inlet is always the same.

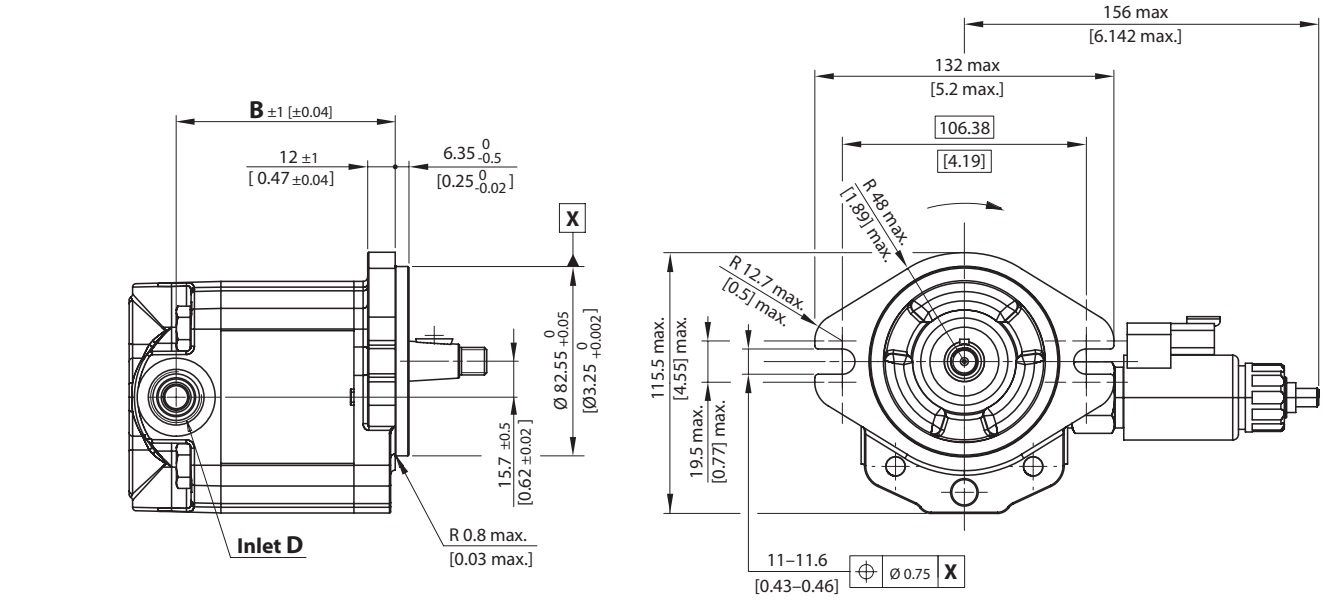
Model code example and maximum shaft torque

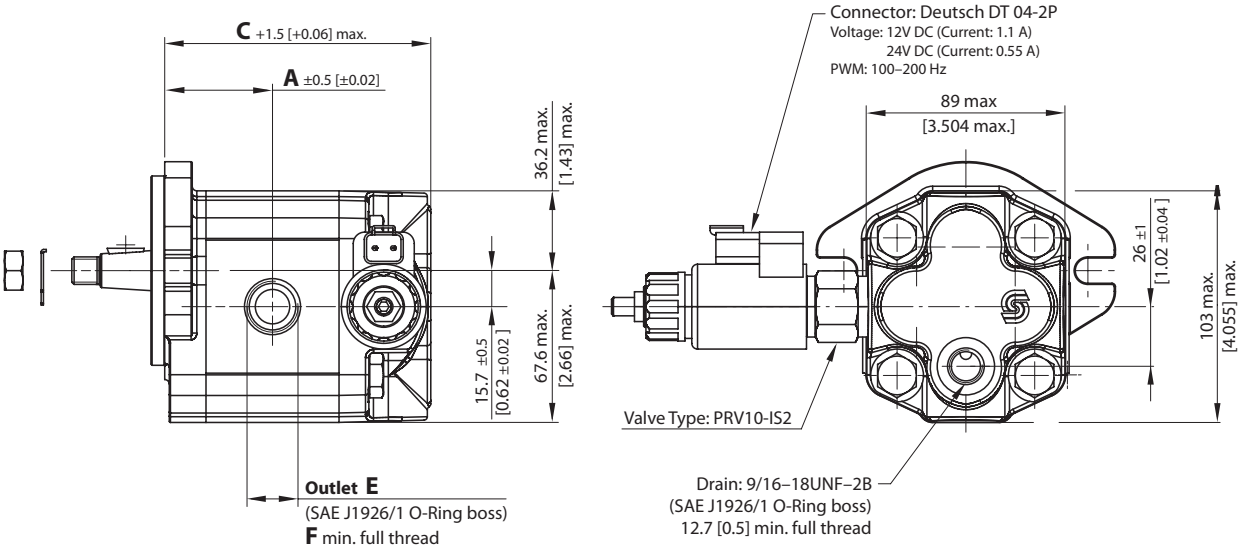
Flange/shaft	Model code example	Maximum shaft torque
02AA	SGM2YN/014LA02AAY6NNE5NNNN/XNNNN	140 N•m [1239 lb•in]

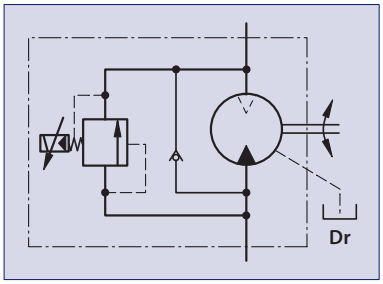
For further details on ordering, see *Model Code,* pages 26 - 28.

SGM2YN • 06BA dimensions

mm
[in]

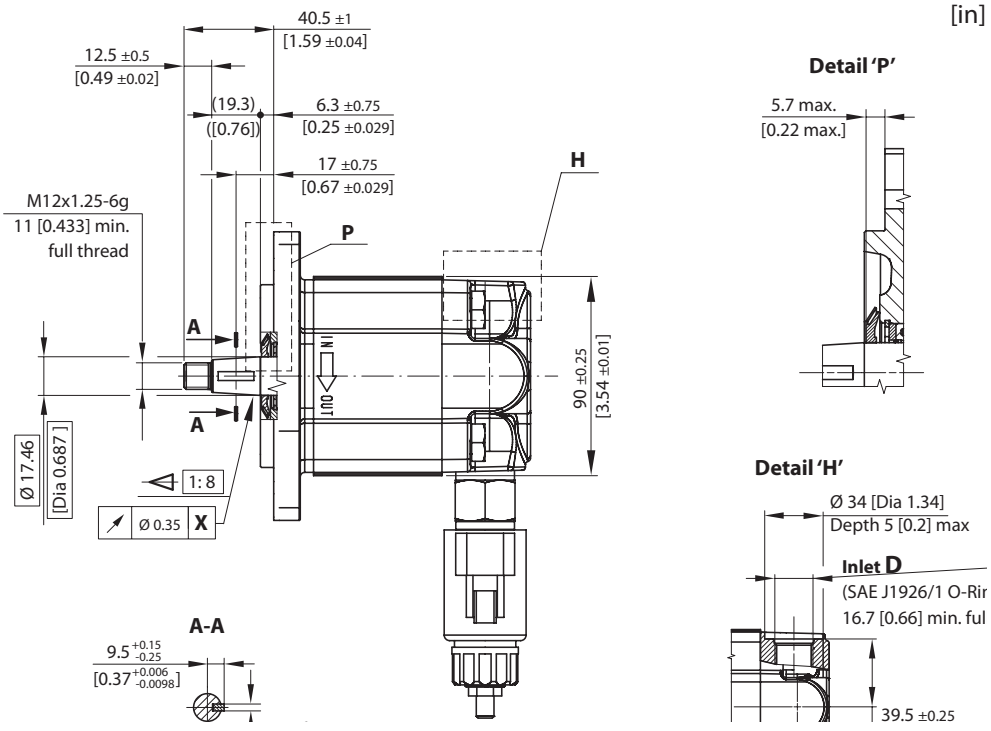






SGM2YN • 06BA dimensions (continued)

mm
[in]



SGM2YN – 06BA dimensions

Frame size		8,0	011	014	017	019	022	025
Dimension	A	47 [1.85]	49 [1.93]	52 [2.05]	54 [2.13]	56 [2.21]	59 [2.32]	61 [2.40]
	B	95.5 [3.76]	99.5 [3.92]	105.5 [4.15]	109.5 [4.31]	113.5 [4.47]	119.5 [4.70]	123.5 [4.86]
	C	116 [4.57]	120 [4.72]	126 [4.96]	130 [5.11]	134 [5.28]	140 [5.51]	144 [5.67]
Inlet	D	7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Outlet	E	7/8–14UNF–2B				1–1/16–12UN–2B		
	F	16.7 [0.66] min. full thread				19 [0.75] min. full thread		
Drain port		9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

Inlet is always the same.

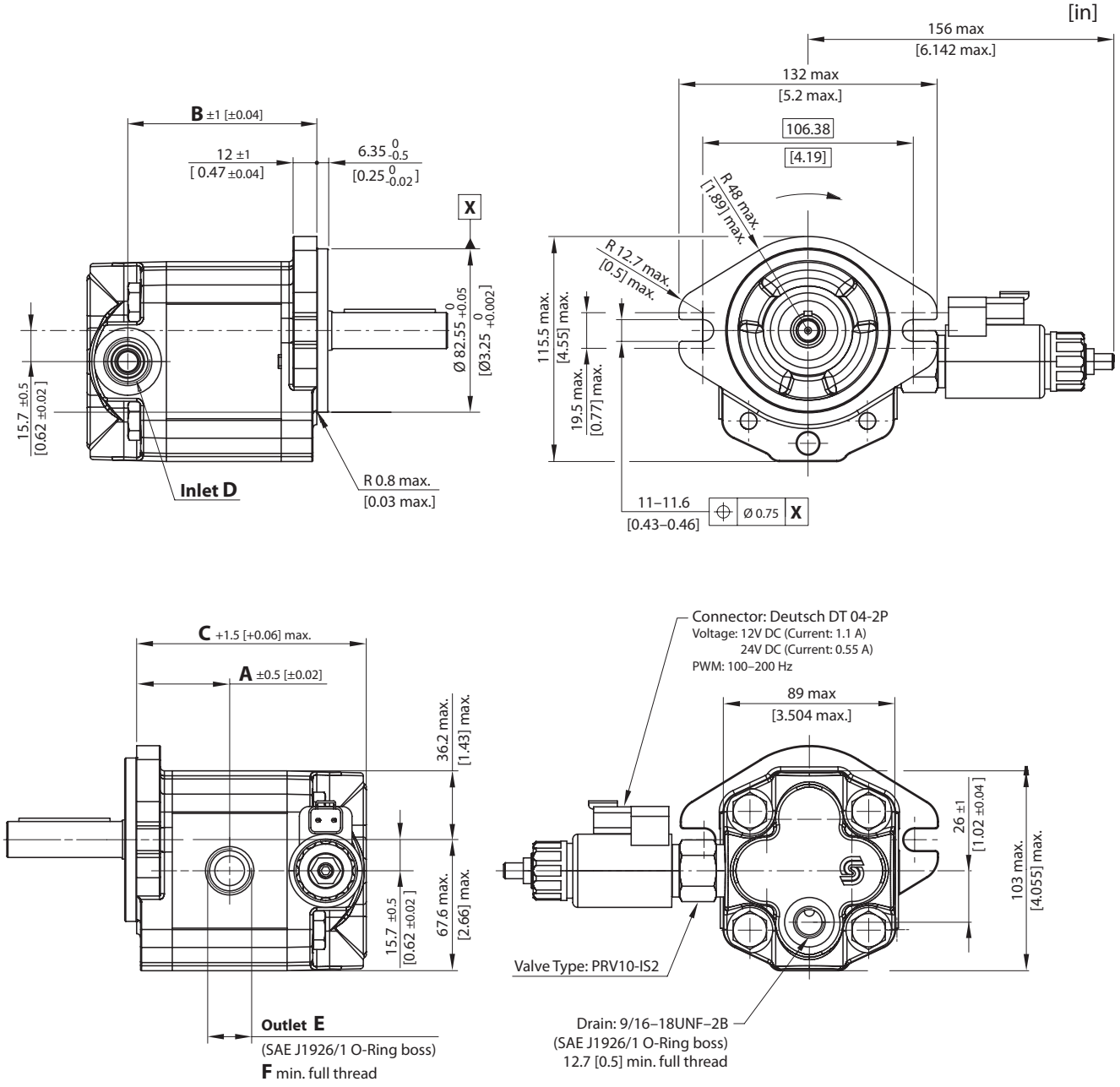
Model code example and maximum shaft torque

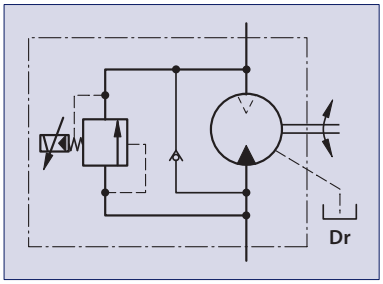
Flange/shaft	Model code example	Maximum shaft torque
06BA	SGM2YN/025RA06BAY6NNE6NNNN/XNNNN	150 N•m [1328 lb•in]

For further details on ordering, see *Model Code,* pages 26 - 28.

SGM2YN • 06GB dimensions

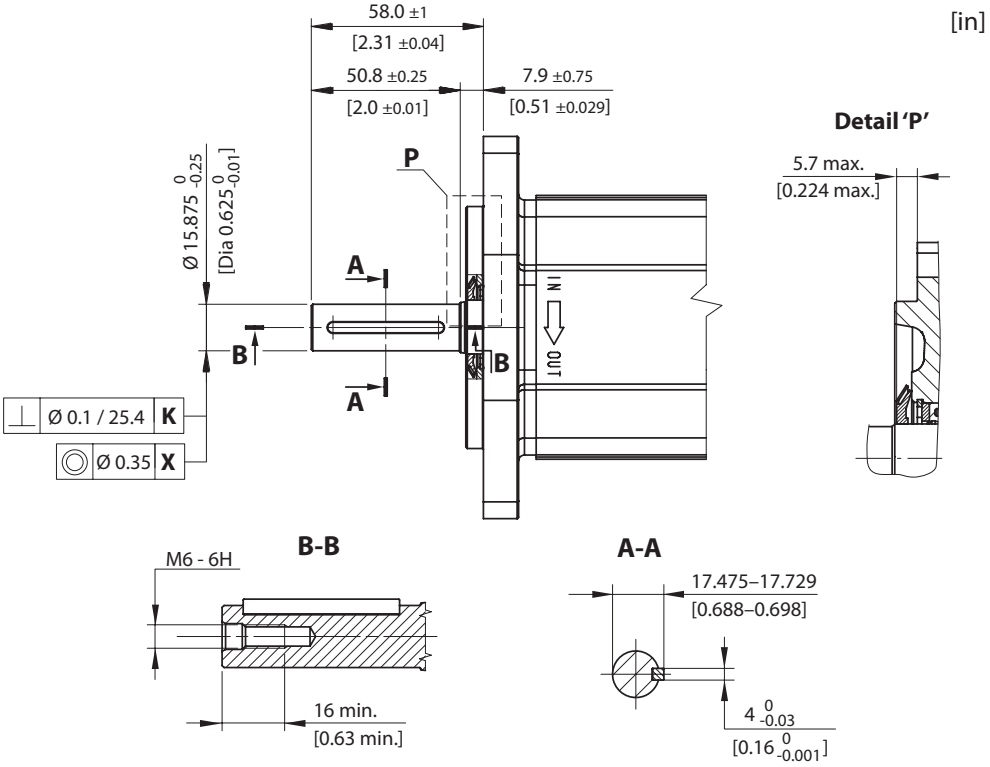
mm
[in]





SGM2YN • 06GB dimensions (continued)

mm
[in]



SGM2YN – 06GB dimensions

Frame size		8,0	011	014	017	019	022	025
Dimension	A	47 [1.85]	49 [1.93]	52 [2.05]	54 [2.13]	56 [2.21]	59 [2.32]	61 [2.40]
	B	95.5 [3.76]	99.5 [3.92]	105.5 [4.15]	109.5 [4.31]	113.5 [4.47]	119.5 [4.70]	123.5 [4.86]
	C	116 [4.57]	120 [4.72]	126 [4.96]	130 [5.11]	134 [5.28]	140 [5.51]	144 [5.67]
Inlet	D	7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Outlet	E	7/8–14UNF–2B				1–1/16–12UN–2B		
	F	16.7 [0.66] min. full thread				19 [0.75] min. full thread		
Drain port		9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

Inlet is always the same.

Model code example and maximum shaft torque

Flange/shaft	Model code example	Maximum shaft torque
06GB	SGM2YN/022L406GBY6NNE6NNNN/XNNNN	80 N•m [708 lb•in]

For further details on ordering, see *Model Code,* pages 26 - 28.

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
Group 2 Fan Drive Gear Motors – SGM2VC

Motor design

SGM2VC

SGM2VC is Group 2 fan drive motor with integrated DCV valve for "reverse function", anti-shock and proportional relief valve. Inlet/outlet and radial drain line are on cast iron rear cover.

Displacement range from 8.4 cm^3/rev up to 25.2 cm^3/rev [from 0.51 up to 1.54 in^3/rev].

Configurations include European and SAE flanges; taper 1:8, taper 1:5 and parallel Ø15.875 mm [Dia 0,62 in] shafts.

Outrigger bearing available as SAE A flange with taper shaft 1:8 and European flange with taper shaft 1:5.

SGM2VC

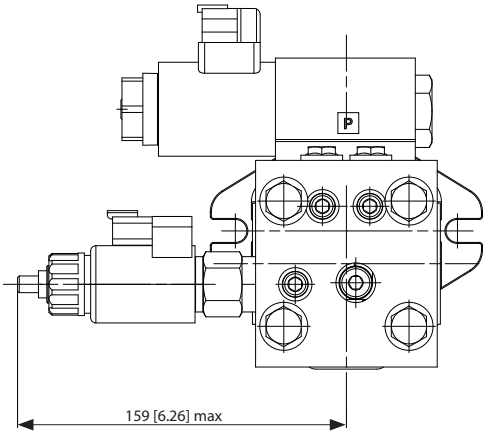
Technical data

Technical data for SGM2VC standard fan drive gear motors

Frame size		8,0	011	014	017	019	022	025
Displacement	cm^3/rev [in^3/rev]	8.4 [0.51]	10.8 [0.66]	14.4 [0.88]	16.8 [1.03]	19.2 [1.17]	22.8 [1.39]	25.2 [1.54]
Peak pressure	bar [psi]	270 [3916]	270 [3916]	270 [3916]	250 [3626]	230 [3336]	200 [2900]	180 [2610]
Rated pressure		250 [3626]	250 [3626]	250 [3626]	230 [3336]	210 [3046]	180 [2610]	160 [2320]
Back pressure		150 [2176]	150 [2176]	150 [2176]	150 [2176]	130 [1885]	100 [1450]	100 [1450]
Maximum speed	min^{-1} (rpm)	3500	3500	3500	3500	3200	3200	3200
Minimum speed		700	700	700	500	500	500	500
Weight	kg [lb]	8.41 [18.54]	8.96 [19.75]	9.11 [20.08]	9.26 [20.41]	9.36 [20.63]	9.51 [20.96]	9.61 [21.19]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lbf•ft^2]	32.4 [769]	38.4 [911]	47.3 [1122]	53.3 [1265]	59.2 [1405]	68.1 [1616]	74.1 [1758]

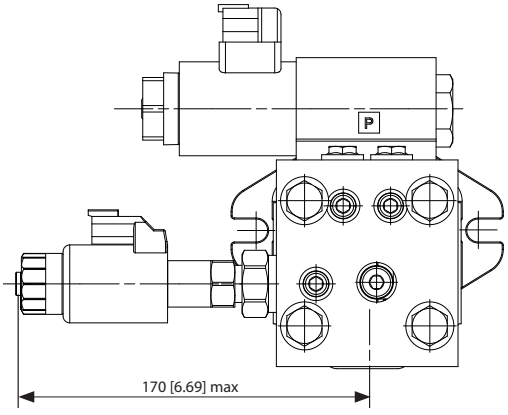
Technical data (continued)

Electro proportional relief valve - standard and D03 directional valve



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 7.2 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 28.8 Ω @ 20 °C [68 °F]
Directional valve coil	12 - 24 V DC
PWM frequency	from 100 to 200 Hz

Electro proportional relief valve - flat curve and D03 directional valve



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 6.4 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 26.2 Ω @ 20 °C [68 °F]
Directional valve coil	12 - 24 V DC
PWM frequency	from 100 to 250 Hz

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
SGM2VC – Group 2 Fan Drive Gear Motors

Model code

A						B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	2	V	C	/				A						N	N	N	N	N	N	N	N	/					

A *Type*

SGM2VC	Gr2 Fan Drive Motor with EH Proportional Reverse Control ; Inlet-Outlet on Cast Iron Cover - Radial Drain

B *Displacement*

8,0	8.4 cm³/rev [0.51 in³/rev]
011	10.8 cm³/rev [0.66 in³/rev]
014	14.4 cm³/rev [0.88 in³/rev]
017	16.8 cm³/rev [1.02 in³/rev]
019	19.2 cm³/rev [1.12 in³/rev]
022	22.8 cm³/rev [1.39 in³/rev]
025	25.2 cm³/rev [1.54 in³/rev]

C *Sense of rotation*

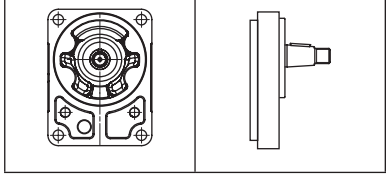
R	Right (Clockwise) with Left Hand Reversing-Drain on Drive gear side
L	Left (Counterclockwise) with Right Hand Reversing-Drain on Idler gear side

D *Version*

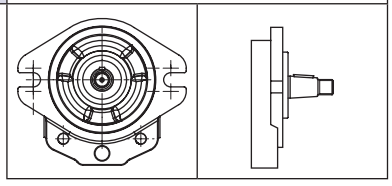
A	High temperature sealing, Dust protector, Galvanized screws

E *Mounting flange and shaft*

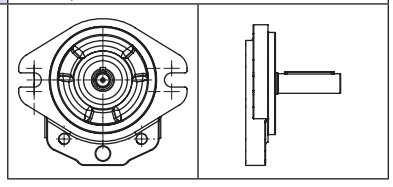
02AA	European 02 flange, pilot Ø 80 mm [Dia 3.15 in] 4-bolts - 1:5 Tapered shaft, Key 3 – M12 x 1.25



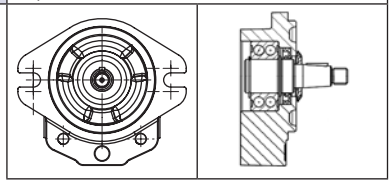
06BA	SAE A flange, pilot Ø 82.55 [Dia 3.25 in] 2-bolts - 1:8 Tapered shaft, Key 4 – M12 x 1.25



06GB	SAE A flange, pilot Ø 82.55 mm [Dia 3.25 in] 2-bolts- Ø 15.875 mm [Dia 0.625 in] Parallel shaft L=50.8 mm [2 in] thd hole M6 Key 4x40 mm [1.57 in]

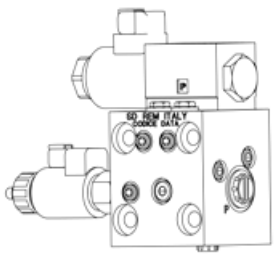


9YDB	Outrigger Bearing with dust cover - SAE A flange pilot Ø 82,55 [Dia 3.25 in] 2-bolts - 1:8 Tapered shaft, Key 4 – M12 x 1.25



F *Rear cover*

RA	Proportional PRV Reversing Valve Cover, 12 V DCV03 Deutsch connector, Anti-Shock-MakeUp Valve, 7/8-14 UNF Work Ports, 9/16-18 UNF Radial Drain Port
RB	Proportional PRV Reversing Valve Cover, 24 V DCV03 Deutsch connector, Anti-Shock-MakeUp Valve, 7/8-14 UNF Work Ports, 9/16-18 UNF Radial Drain Port



G *Inlet body port*

NN	No inlet on body

Model code (continued)

A				B			C	D	E			F	G		H		I		J	K		L			M	N
S	G	M	2	V	C	/			A						N	N	N	N	N	N	/					

H *Outlet body port*

NN	No outlet on body

J *Sealing*

N	Standard high temperature seals

I *Outlet port position, variant body*

NN	Standard

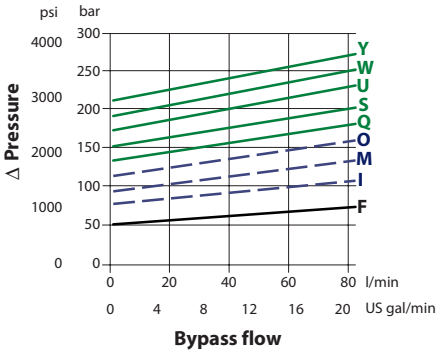
K *Screws*

N	Standard zinc plated screws

L *Valve*

XNN	No valve
XA*	Standard relief valve with coil voltage 12 V DC, DT connector
XB*	Standard relief valve with coil voltage 24 V DC, DT connector

X*F
X*I
X*M
X*O
X*Q
X*S
X*U
X*W
X*Y



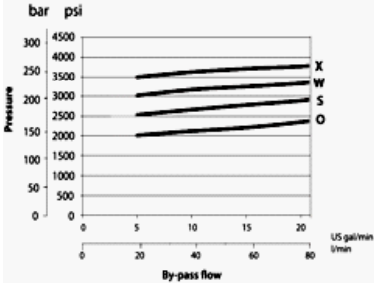
Select Pressure vs. Bypass flow requirements using the graph.

Three color curves represent three types of valves.

Each valve is characterized by different nominal spring ranges.

SA*	Flat curve valve with coil voltage 12 V DC, DT connector
SB*	Flat curve valve with coil voltage 24 V DC, DT connector

S*O
S*S
S*W
S*X



Select Pressure vs. Bypass flow requirements using the graph.

Each valve is characterized by different nominal spring ranges.

⚠ Caution

Maximum pressure setting will vary depending on pressure vs. bypass flow requirements.

M *Marking*

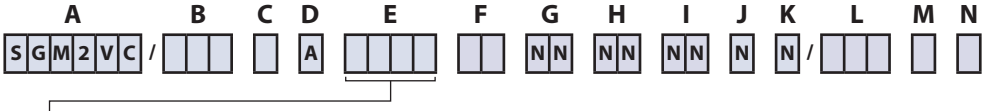
N	Standard marking
A	Standard + customer code
Z	Without marking
*****	Special customer marking

N *Mark position*

N	Standard marking position
A	Idler gear side

Mounting flange and shaft options

Turolla OCG offers two types of industry standard mounting flanges. *The table below* shows order codes for each available mounting flange and its intended use:



Code	Flange/Shaft Description	Maximum torque Code 02 flange	 Code 06 flange
02AA	European, pilot Ø 80 mm [Dia 3.15 in], 4-bolts Taper 1:5, Key 3 – M12 x 1.25	140 N•m [1239 lb•in]	–
06BA	SAE A, pilot Ø 82.55 mm [Dia 3.25 in], 2-bolts Taper 1:8, Key 4 – M12 x 1.25	–	150 N•m [1328 lb•in]
06GB	SAE A, pilot Ø 82.55 mm [Dia 3.25 in], 2-bolts Parallel Ø 15.875 [Dia 0.625], L 50.8 [2]	–	80 N•m [708 lb•in]

Spline configuration is not available for Group 2 fan drive motors. Other shaft options may exist. Contact your Turolla OCG representative for availability.

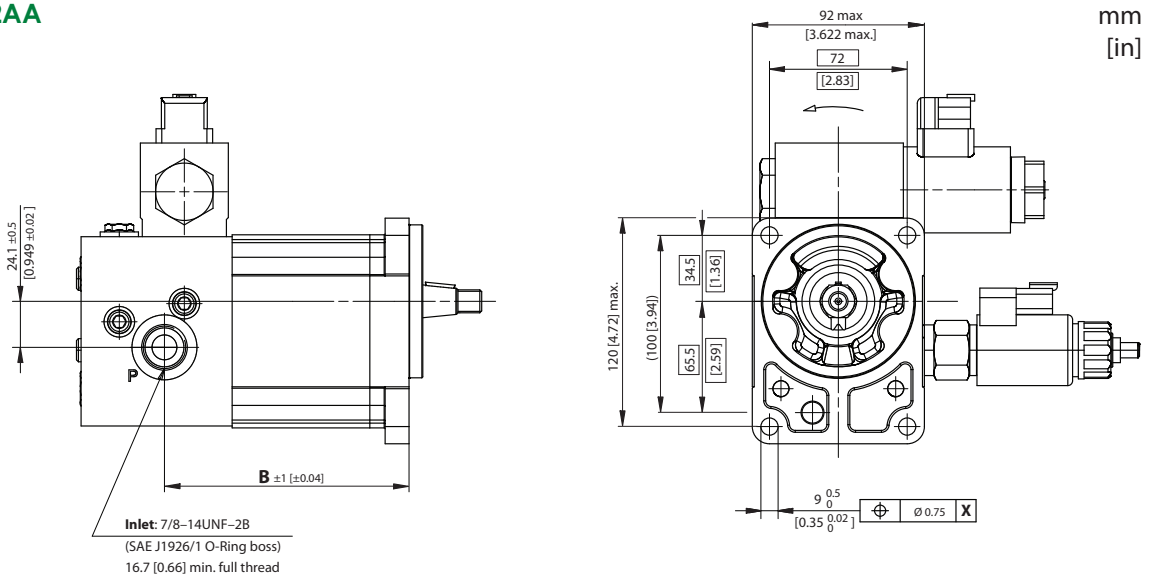
Caution

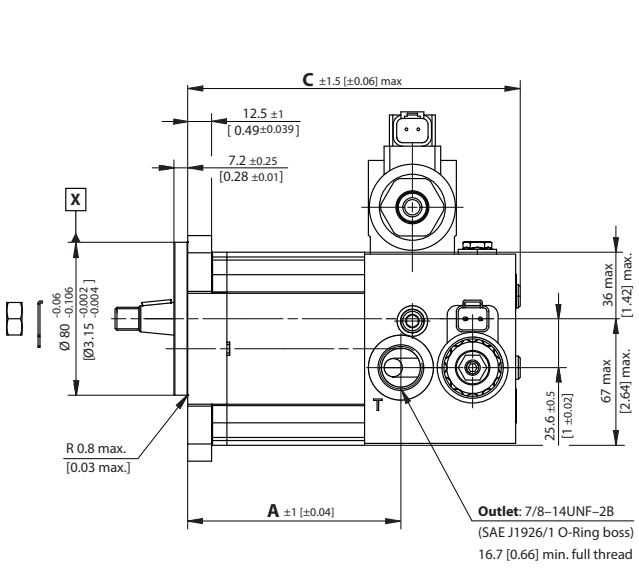
Shaft torque capability may limit allowable pressure. Torque ratings assume no external radial loading. Applied torque must not exceed these limits, regardless of stated pressure parameters. Maximum torque ratings are based on shaft torsional fatigue strength.

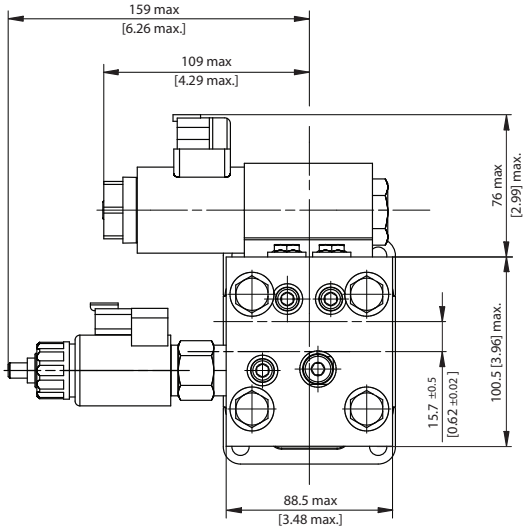
Notes

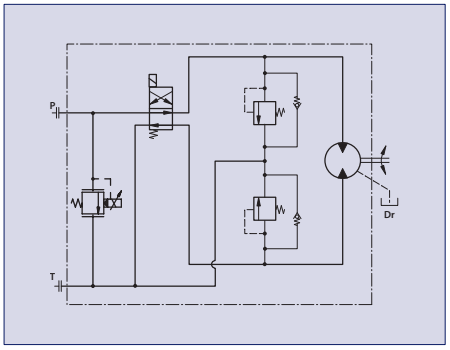
SGM2VC • 02AA dimensions

mm
[in]



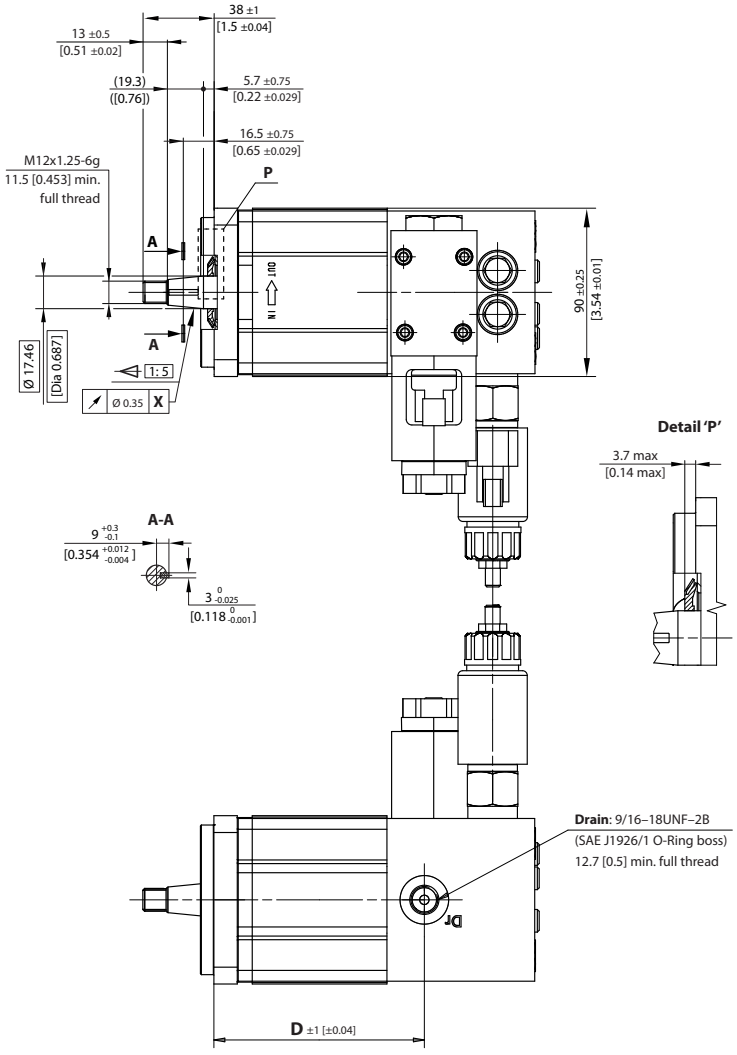






SGM2VC • 02AA dimensions (continued)

mm
[in]



SGM2VC – 02AA dimensions

Frame size		8,0	011	014	017	019	022	025
Dimension	A	97.5 [3.84]	101.5 [4.0]	107.5 [4.23]	111.5 [4.39]	115.5 [4.55]	121.5 [4.78]	125.5 [4.94]
	B	114 [4.49]	118 [4.65]	124 [4.88]	128 [5.04]	132 [5.20]	138 [5.43]	142 [5.59]
	C	160 [6.30]	164 [6.46]	170 [6.69]	174 [6.85]	178 [7.0]	184 [7.24]	188 [7.40]
	D	98.5 [3.88]	102.5 [4.04]	108.5 [4.27]	112.5 [4.43]	116.5 [4.59]	122.5 [4.82]	126.5 [4.98]
Inlet/Outlet		7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Drain port		9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

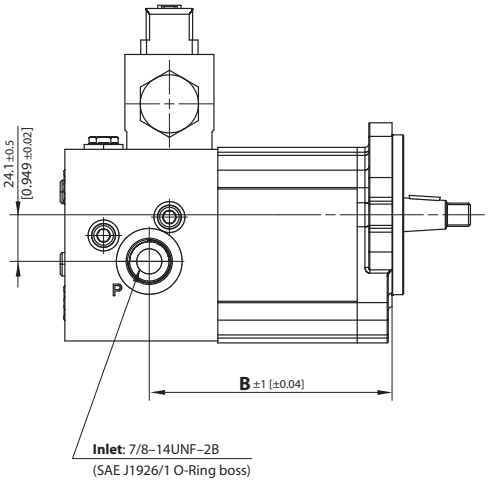
Model code example and maximum shaft torque

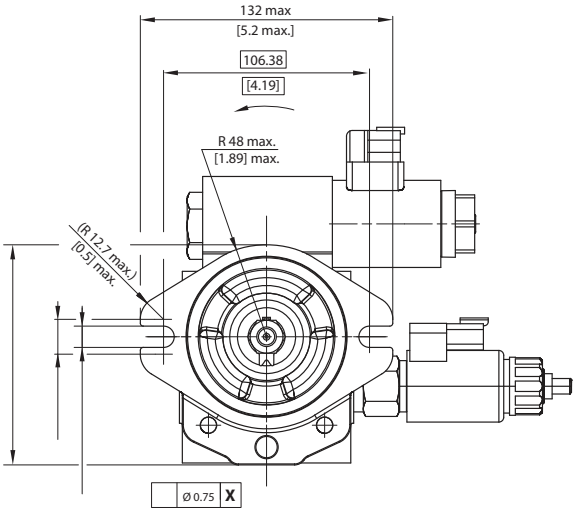
Flange/shaft	Model code example	Maximum shaft torque
02AA	SGM2VC/014LA02AARANNNNNNNN/XASNN	140 N•m [1239 lb•in]

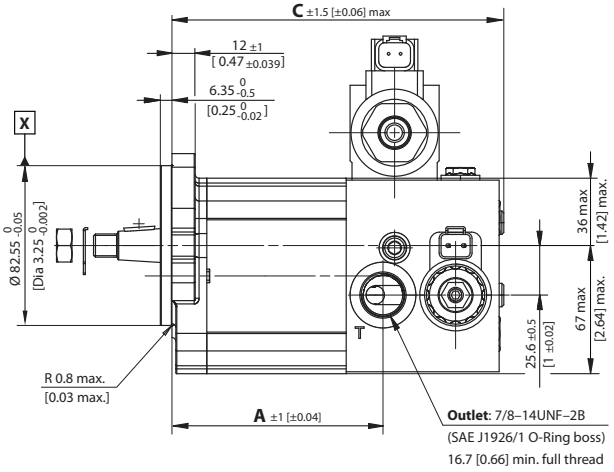
For further details on ordering, see *Model Code,* pages 40 and 41.

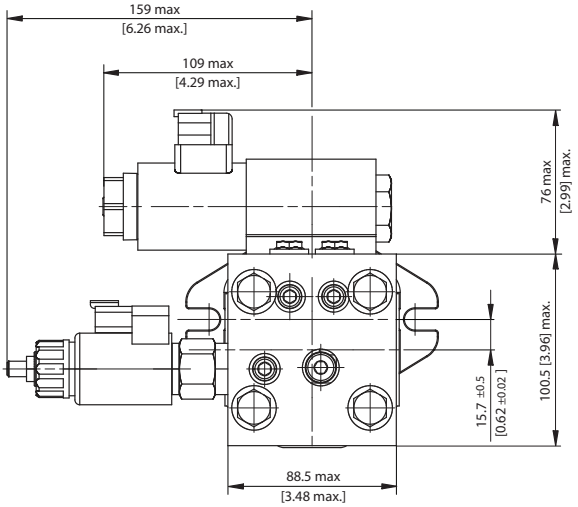
SGM2VC • 06BA dimensions

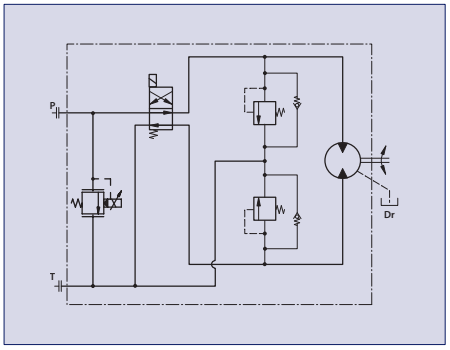
mm
[in]





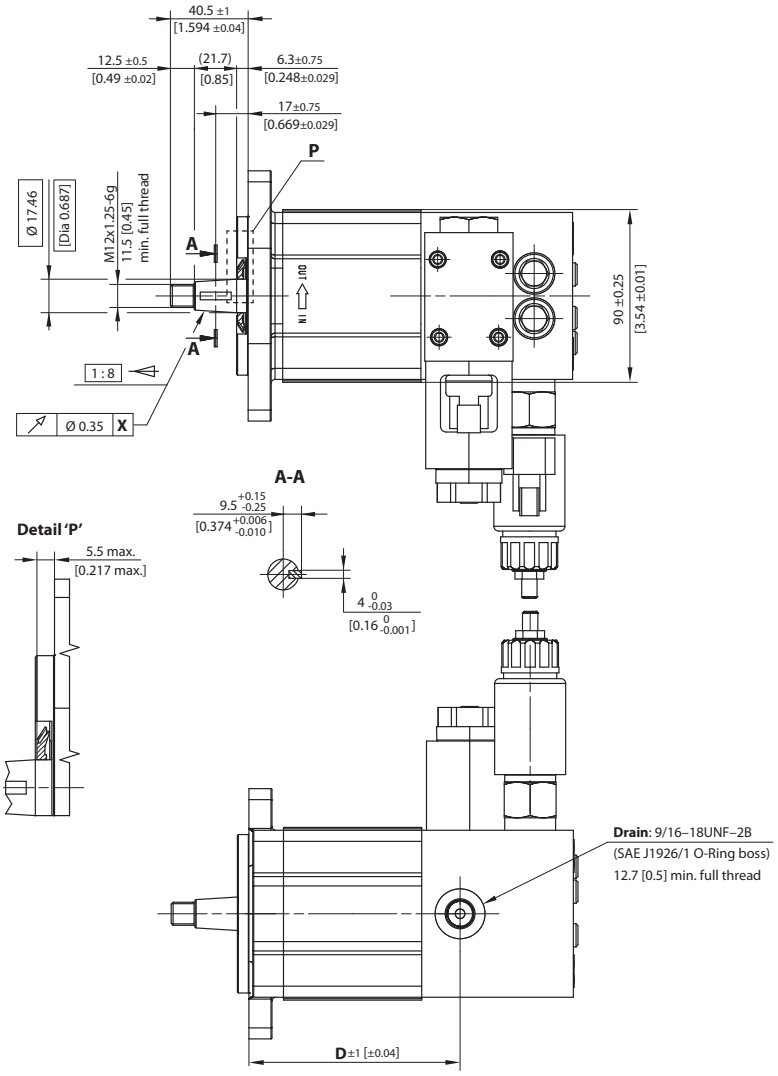






SGM2VC • 06BA dimensions (continued)

mm
[in]



SGM2VC – 06BA dimensions

Frame size		8,0	011	014	017	019	022	025
Dimension	A	95 [3.74]	99 [3.90]	105 [4.13]	109 [4.29]	113 [4.45]	119 [4.69]	123 [4.84]
	B	111.4 [4.39]	115.4 [4.54]	121.4 [4.78]	125.4 [4.94]	129.4 [5.09]	135.4 [5.33]	139.4 [5.49]
	C	157.4 [6.20]	161.4 [6.35]	167.4 [6.59]	171.4 [6.75]	175.4 [6.90]	181.4 [7.14]	185.4 [7.30]
	D	96 [3.78]	100 [3.94]	106 [4.17]	110 [4.33]	114 [4.49]	120 [4.72]	124 [4.88]
Inlet/Outlet		7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Drain port		9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

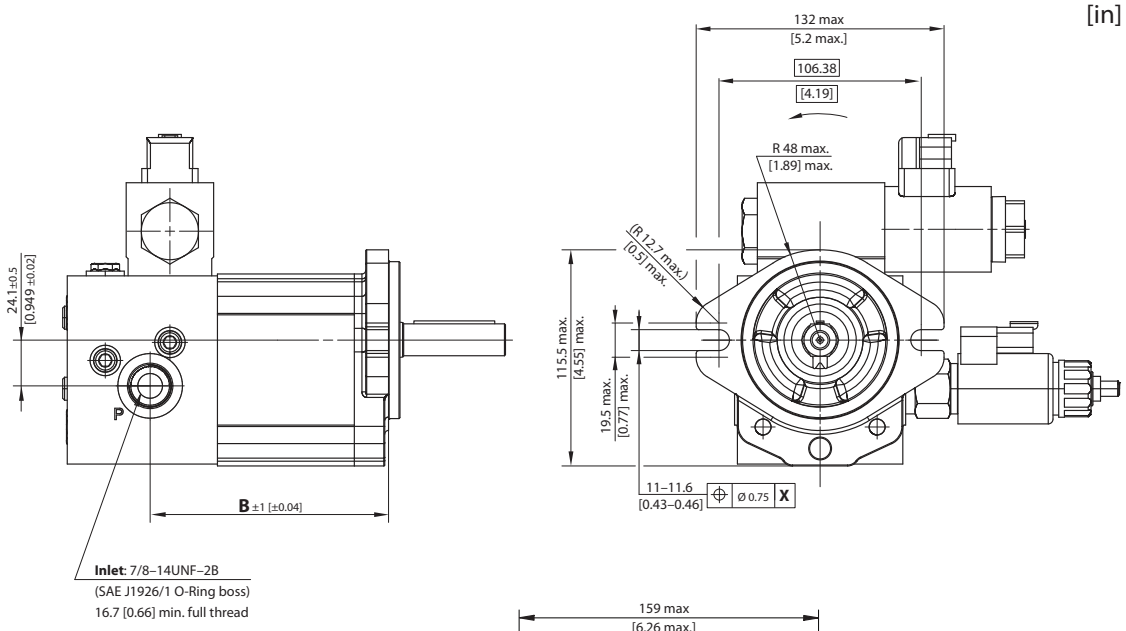
Model code example and maximum shaft torque

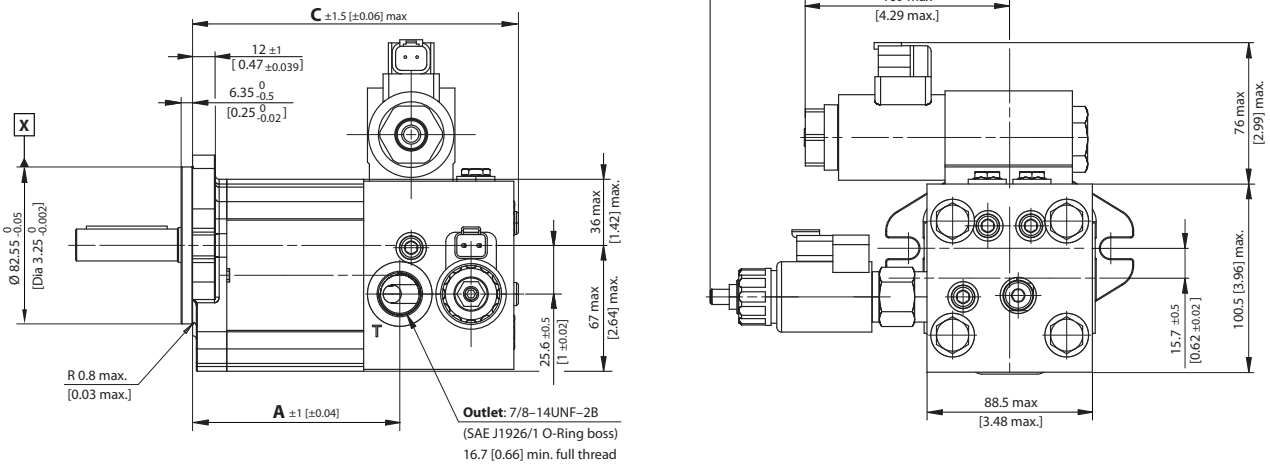
Flange/shaft	Model code example	Maximum shaft torque
06BA	SGM2VC/014LA06BARANNNNNNNN/XASNN	150 N•m [1328 lb•in]

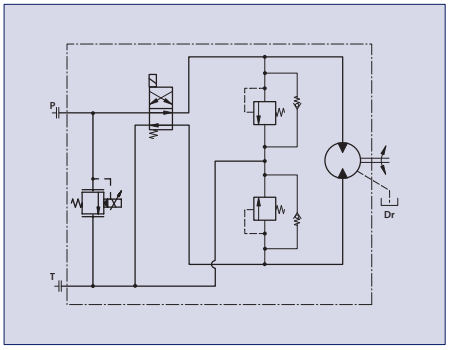
For further details on ordering, see *Model Code,* pages 40 and 41.

SGM2VC • 06GB dimensions

mm
[in]

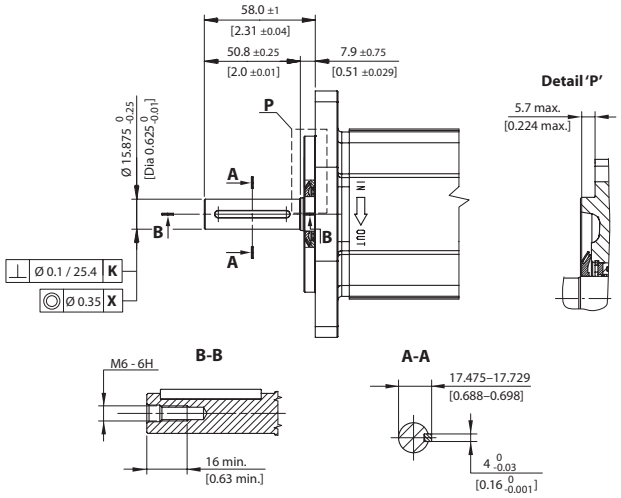






SGM2VC • 06GB dimensions (continued)

mm
[in]



SGM2VC – 06GB dimensions

Frame size		8,0	011	014	017	019	022	025
Dimension	A	95 [3.74]	99 [3.90]	105 [4.13]	109 [4.29]	113 [4.45]	119 [4.69]	123 [4.84]
	B	111.4 [4.39]	115.4 [4.54]	121.4 [4.78]	125.4 [4.94]	129.4 [5.09]	135.4 [5.33]	139.4 [5.49]
	C	157.4 [6.20]	161.4 [6.35]	167.4 [6.59]	171.4 [6.75]	175.4 [6.90]	181.4 [7.14]	185.4 [7.30]
	D	96 [3.78]	100 [3.94]	106 [4.17]	110 [4.33]	114 [4.49]	120 [4.72]	124 [4.88]
Inlet/Outlet		7/8–14UNF–2B (SAE J1926/1 O-Ring boss); 16.7 [0.66] min. full thread						
Drain port		9/16–18UNF–2B (SAE J1926/1 O-Ring boss); 12.7 [0.5] min. full thread						

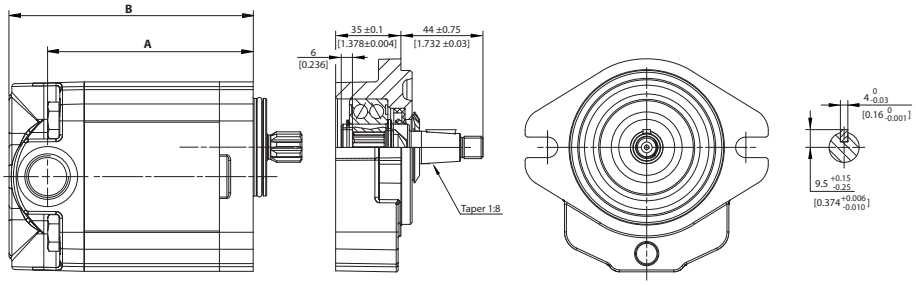
Model code example and maximum shaft torque

Flange/shaft	Model code example	Maximum shaft torque
06GB	SGM2VC/014RA06GBRANNNNNNNN/SASNN	80 N•m [708 lb•in]

For further details on ordering, see *Model Code,* pages 40 and 41.

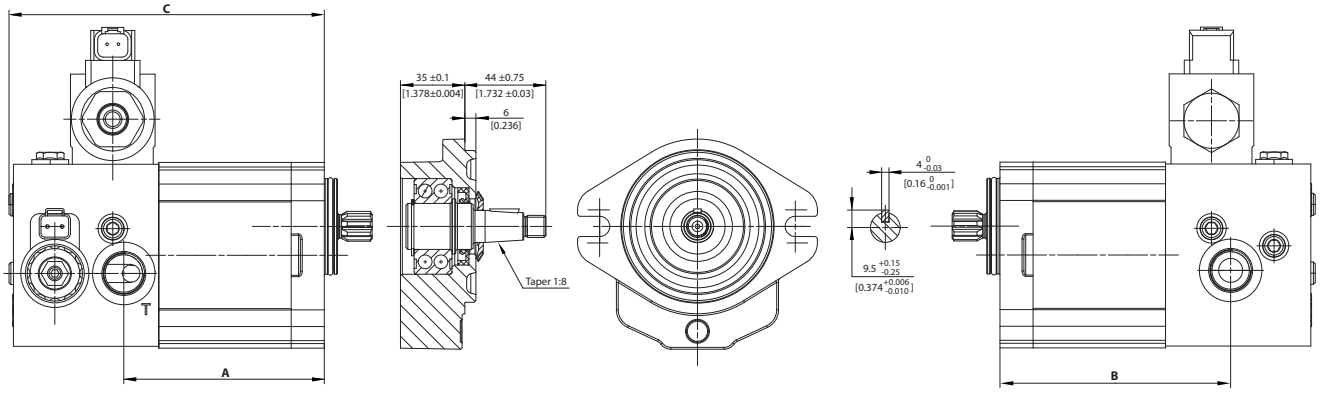
Outrigger bearing

SGM2NC and SGM2YN dimensions



Frame size	8,0	011	014	017	019	022	025
A	95.5 [3.76]	99.5 [3.92]	105.5 [4.15]	109.5 [4.31]	113.5 [4.47]	119.5 [4.70]	123.5 [4.86]
B	116 [4.66]	120 [4.83]	126 [5.05]	130 [5.22]	134 [5.37]	140 [5.61]	144 [5.77]

SGM2VC dimensions



Frame size	8,0	011	014	017	019	022	025
A	95 [3.74]	99 [3.90]	105 [4.13]	109 [4.29]	113 [4.45]	119 [4.69]	123 [4.84]
B	111.4 [4.39]	115.4 [4.54]	121.4 [4.78]	125.4 [4.94]	129.4 [5.09]	135.4 [5.33]	139.4 [5.49]
C	157.4 [6.20]	161.4 [6.35]	167.4 [6.59]	171.4 [6.75]	175.4 [6.90]	181.4 [7.14]	185.4 [7.30]

SGM2 and SGM3 Fan Drive Gear Motors Technical Information

Group 3 Fan Drive Gear Motors – SGM3NC

Motor design

SGM3NC

SGM3NC is Group 3 bidirectional fan drive motor with inlet/outlet on cast iron rear cover and axial drain line

Displacement range from 22.1 cm^3/rev up to 44.1 cm^3/rev [from 1.34 in^3/rev up to 2.69 in^3/rev].

Configurations include European and SAE flanges; taper 1:8, taper 1:5 and parallel Ø15.875 mm [Dia 0,62 in] shafts.

Outrigger bearing available as SAE A flange with taper shaft 1:8 and European flange with taper shaft 1:5.

SGM3NC

Technical data

Technical data for SGM3NC standard fan drive gear motors

Frame size		022	026	033	038	044
Displacement	cm^3/rev [in^3/rev]	22.1 [1.34]	26.2 [1.60]	33.1 [2.02]	37.9 [2.31]	44.1 [2.69]
Peak pressure	bar [psi]	270 [3916]	270 [3916]	270 [3916]	270 [3916]	270 [3916]
Rated pressure		250 [3626]	250 [3626]	250 [3626]	250 [3626]	250 [3626]
Back pressure		250 [3626]	250 [3626]	250 [3626]	250 [3626]	250 [3626]
Maximum speed	min^{-1} (rpm)	2500	2500	2500	2500	2300
Minimum speed		800	800	800	800	800
Weight	kg [lb]	8.62 [19.0]	8.72 [19.23	8.82 [19.45]	8.88 [19.58]	9.02 [19.89]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lbf•ft^2]	198 [4699]	216 [5126]	246 [5838]	267.2 [6341]	294.2 [6981]

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
SGM3NC – Group 3 Fan Drive Gear Motors

Model code

A			B		C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	3	N	C	/						N	N			N	N	N	N	/	N	N	N		

A *Type*

SGM3NC	Group 3 Fan Drive Motor Cast Iron rear cover Inlet Outlet 1' 1/16-12 UN - Axial Drain

B *Displacement*

022	22.1 cm³/rev [1.34 in³/rev]
026	26.2 cm³/rev [1.60 in³/rev]
033	33.1 cm³/rev [2.02 in³/rev]
038	37.9 cm³/rev [2.31 in³/rev]
044	44.1 cm³/rev [2.69 in³/rev]

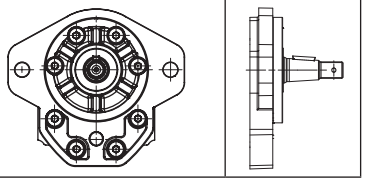
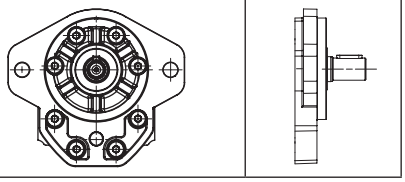
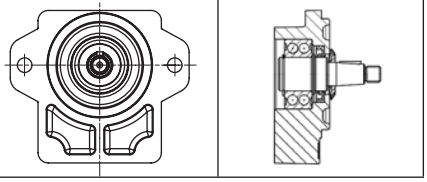
C *Sense of rotation*

B	**B**idirectional

D *Version*

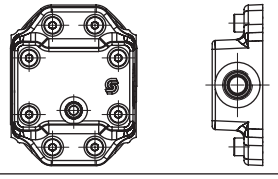
A	High temperature sealing Dust protector Rust protected screws

E *Mounting flange and shaft*

07BC	**07GB**	**9YDA**
SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts 1:8 Tapered shaft thread 5/8-18UNF, Key 6,375mm [0.25 in]	SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts - 22.225 mm parallel shaft L=25.4mm [1in] Key 6,375mm [0,25in]-Threaded hole 1/4-20 UNC	Outrigger Bearing with dust cover - SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts - 1:8 Tapered shaft thread 5/8-18UNF, Key 6,375mm [0.25 in]
		

F *Rear cover*

C6	Cast Iron cover with 1'-1/16 12 UN In-Out Ports - 9/16-18 UNF Axial Drain (idler gear side)



G *Inlet body port*

NN	No inlet on body

H *Outlet body port*

NN	No outlet on body

I *Outlet port position, variant body*

NN	Standard

J *Sealing*

N	Standard high temperature seals

K *Screws*

N	Standard zinc plated screws

L *Valve*

NNN	No valve

M *Marking*

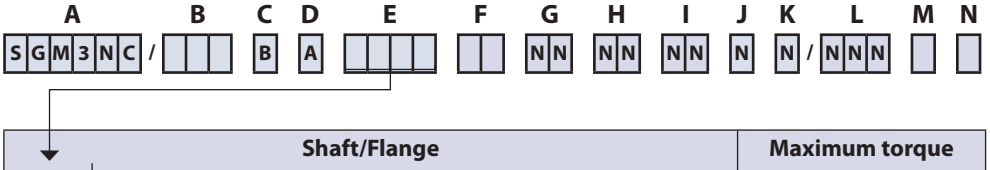
N	Standard marking
A	Standard + customer code
Z	Without marking
*	Special customer marking

N *Mark position*

N	Standard marking position
A	Idler gear side

Mounting flange and shaft options

Turolla OCG offers two types of industry standard mounting flanges. *The table below* shows order codes for each available mounting flange and its intended use:



Code	Shaft/Flange Description	Maximum torque Code 07 flange
07BC	SAE B, pilot Ø 101.6 mm [Dia 4 in], 2-bolts Taper 1:8, 5/8–18UNF, Key 6.375 [0.25]	300 N•m [2655 lb•in]
07GB	SAE B, pilot Ø 101.6 mm [Dia 4 in], 2-bolts Parallel drive Ø 22.225 [Dia 0.875], L = 25.4 [1] ,Key 6.375 [0.25]	230 N•m [2036 lb•in]

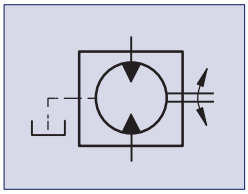
Spline configuration is not available for Group 3 fan drive motors. Other shaft options may exist. Contact your Turolla OCG representative for availability.

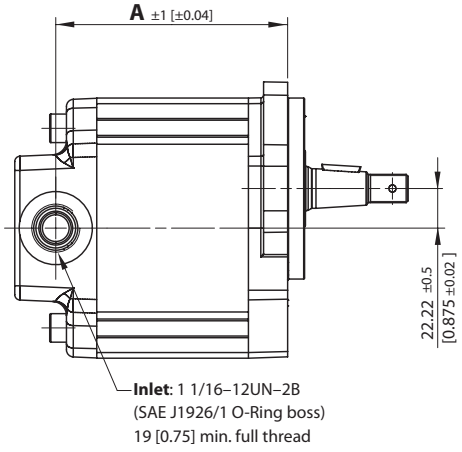
Caution

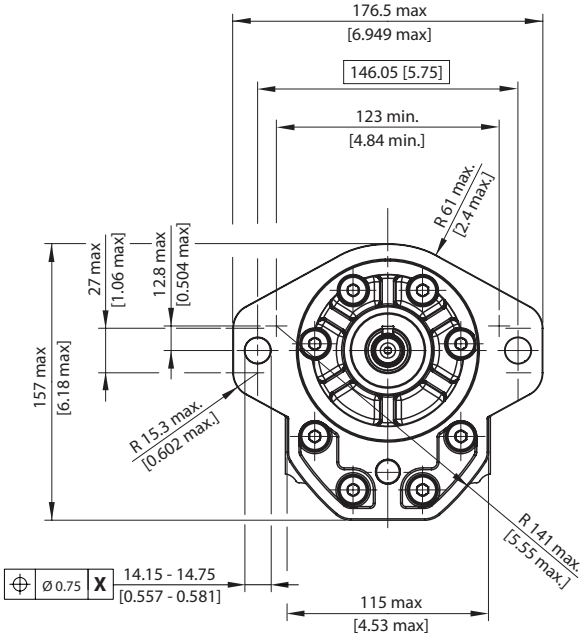
Shaft torque capability may limit allowable pressure. Torque ratings assume no external radial loading. Applied torque must not exceed these limits, regardless of stated pressure parameters. Maximum torque ratings are based on shaft torsional fatigue strength.

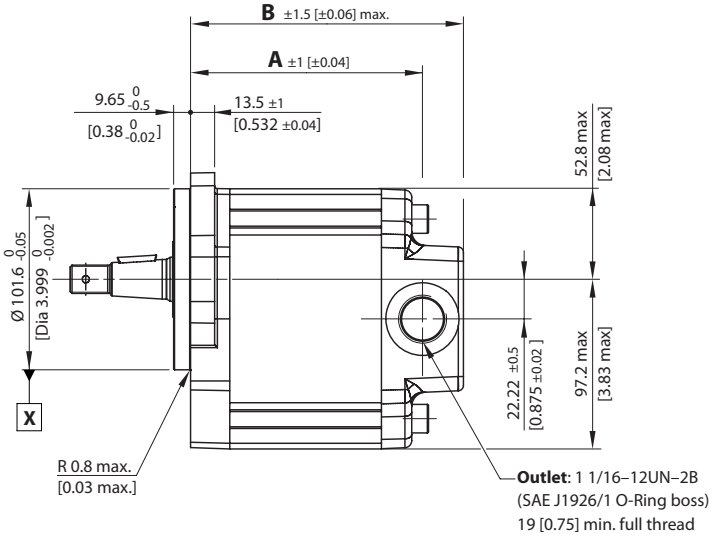
SGM3NC • 07BC dimensions

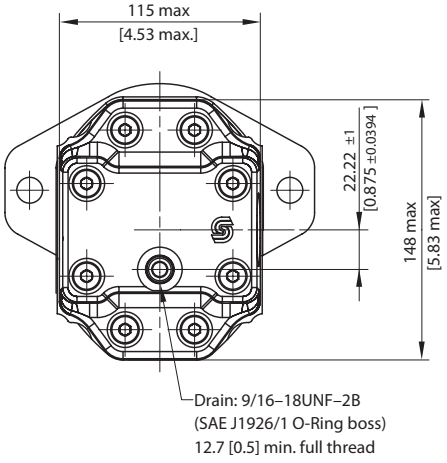
mm
[in]









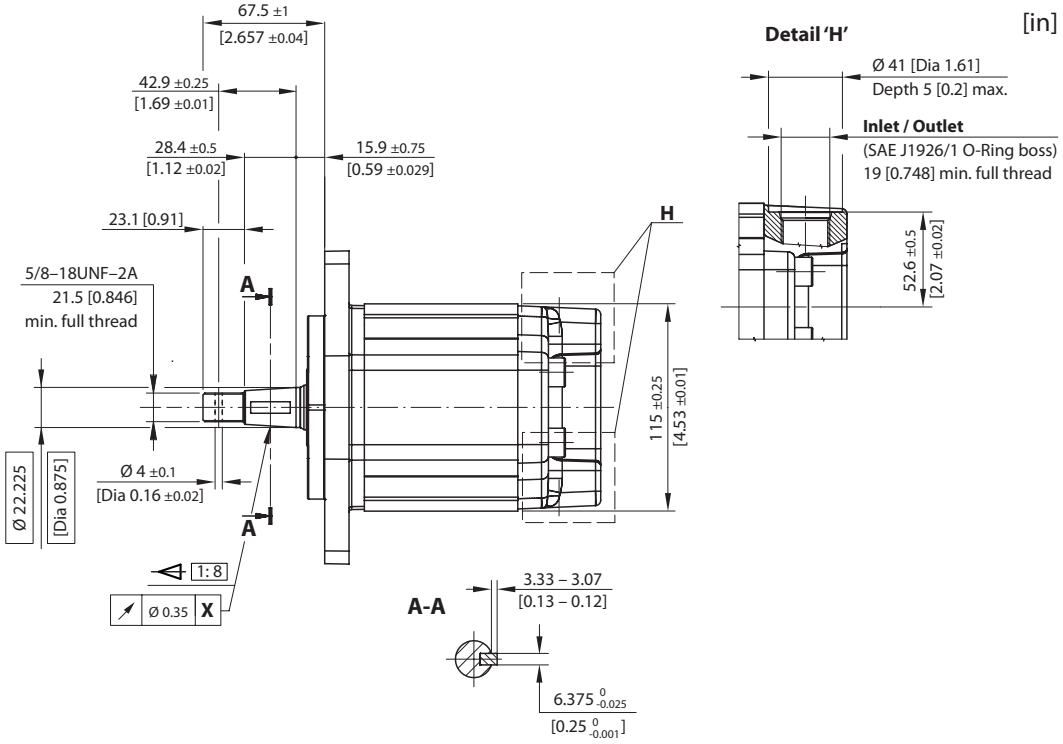


SGM3NC – 07GB dimensions

Frame size		022	026	033	038	044
Dimension	A	127.1 [5.04]	130.1 [5.12]	135.1 [5.32]	138.6 [5.46]	143.1 [5.63]
	B	150.1 [5.91]	153.1 [6.03]	158.1 [6.22]	161.6 [6.36]	166.1 [6.54]
Inlet/Outlet		1–1/16–12UN–2B (SAE J1925/1, O-Ring boss); 19 [0.748] min. full thread				
Drain port		9/16–18UNF–2B (SAE J1925/1, O-Ring boss); 12.7 [0.5] min. full threads				

SGM3NC • 07BC dimensions (continued)

mm
[in]



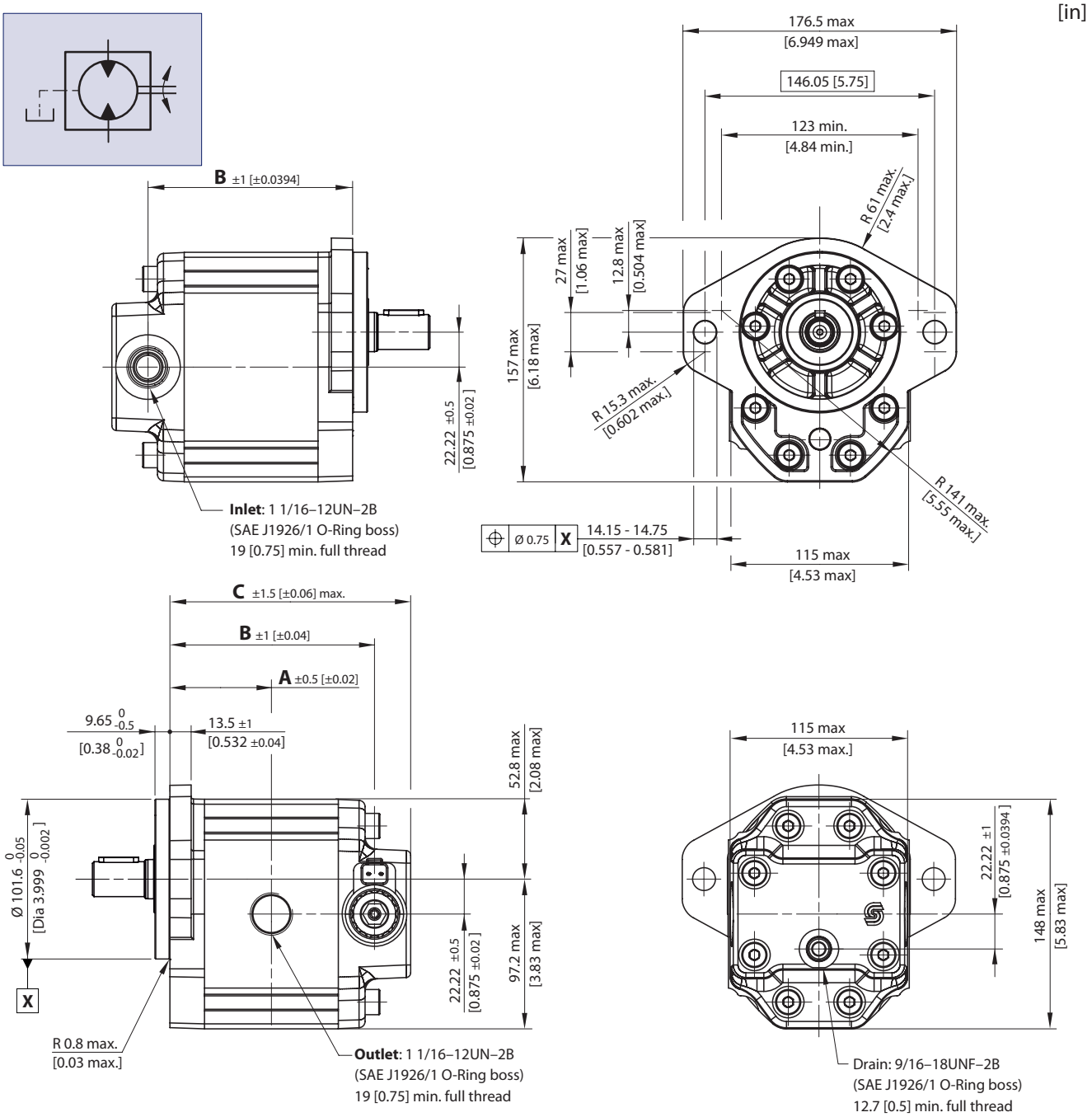
Model code example and maximum shaft torque

Flange/shaft	Model code example	Maximum shaft torque
07BC	SGM3NC/026BA07BCC6NNNNNNNN/NNNNN	300 N•m [2655 lb•in]

For further details on ordering, see *Model Code,* page 52.

SGM3NC • 07GB dimensions

mm
[in]

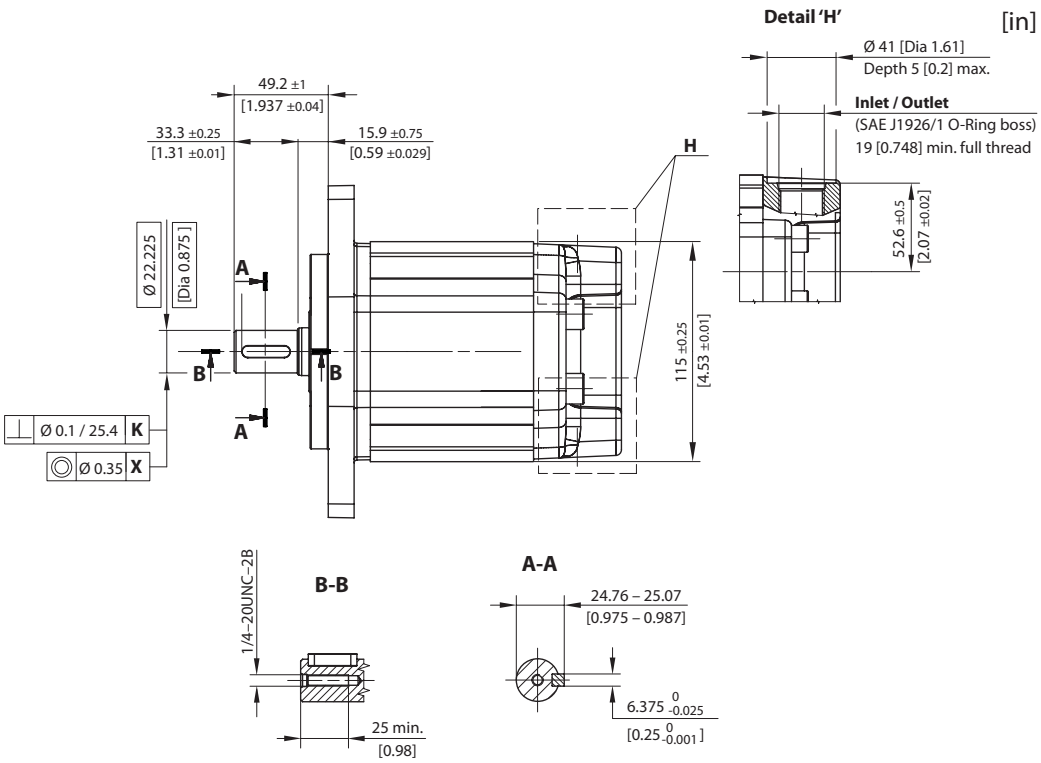


SGM3NC – 07GB dimensions

Frame size		022	026	033	038	044
Dimension	A	127.1 [5.04]	130.1 [5.12]	135.1 [5.32]	138.6 [5.46]	143.1 [5.63]
	B	150.1 [5.91]	153.1 [6.03]	158.1 [6.22]	161.6 [6.36]	166.1 [6.54]
Inlet/Outlet		1–1/16–12UN–2B (SAE J1925/1, O-Ring boss); 19 [0.748] min. full thread				
Drain port		9/16–18UNF–2B (SAE J1925/1, O-Ring boss); 12.7 [0.5] min. full threads				

SGM3NC • 07GB dimensions (continued)

mm
[in]



Model code example and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
07GB	SGM3NC/026BA07GBC6NNNNNNNN/NNNNN	230 N•m [2036 lb•in]

For further details on ordering, see *Model Code,* page 52.

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
Group 3 Fan Drive Gear Motors – SGM3YN

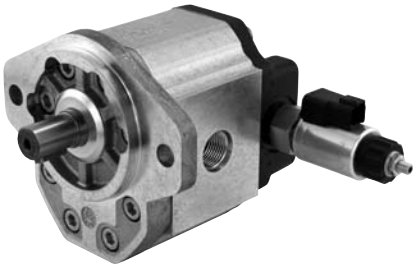
Motor design

SGM3YN

SGM3YN is Group 3 fan drive motor with inlet on rear cover and outlet on body. Integrated proportional relief valve, anti-cavitation check valve and axial drain line.

Displacement range from 22.1 cm^3/rev up to 44.1 cm^3/rev [from 1.34 in^3/rev up to 2.69 in^3/rev].

SGM3YN



Configurations include European and SAE flanges; taper 1:8, taper 1:5 and parallel Ø15.875 mm [Dia 0,62 in] shafts.

Outrigger bearing available as SAE A flange with taper shaft 1:8 and European flange with taper shaft 1:5.

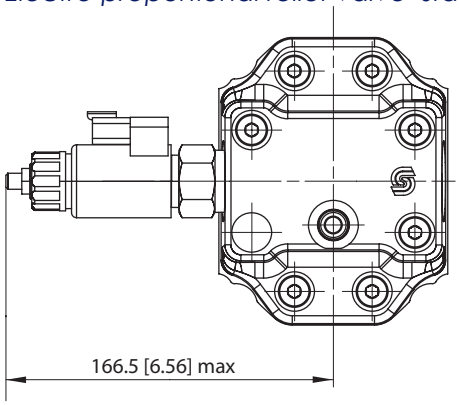
Technical data

Technical data for SGM3YN standard fan drive gear motors

Frame size		022	026	033	038	044
Displacement	cm^3/rev [in^3/rev]	22.1 [1.34]	26.2 [1.60]	33.1 [2.02]	37.9 [2.31]	44.1 [2.69]
Peak pressure	bar [psi]	270 [3916]	270 [3916]	270 [3916]	270 [3916]	270 [3916]
Rated pressure		250 [3626]	250 [3626]	250 [3626]	250 [3626]	250 [3626]
Back pressure		150 [2176]	150 [2176]	150 [2176]	150 [2176]	150 [2176]
Maximum speed	min^{-1} (rpm)	2500	2500	2500	2500	2300
Minimum speed		800	800	800	800	800
Weight	kg [lb]	8.62 [19.0]	8.72 [19.23	8.82 [19.45]	8.88 [19.58]	9.02 [19.89]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lbf•ft^2]	198 [4699]	216 [5126]	246 [5838]	267.2 [6341]	294.2 [6981]

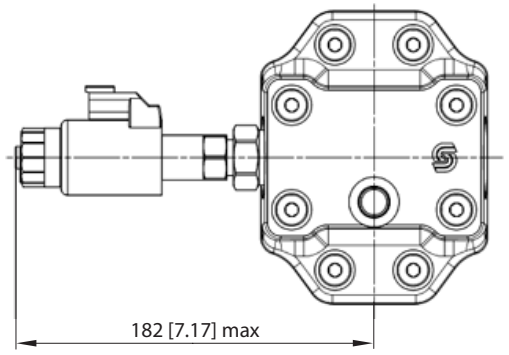
Technical data (continued)

Electro proportional relief valve standard



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 7.2 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 28.8 Ω @ 20 °C [68 °F]
PWM frequency	from 100 to 200 Hz

Electro proportional relief valve flat curve



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 6.4 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 26.2 Ω @ 20 °C [68 °F]
PWM frequency	from 100 to 250 Hz

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
SGM3YN – Group 3 Fan Drive Gear Motors

Model code

A				B		C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	3	Y	N	/							N	N			N	N	N	N	/					

A *Type*

SGM3YN	Gr3 Fan Drive Motor with EH Proportional Pressure Control; Cast Iron cover-Inlet port 1'-1/16 12UN on Cover-Axial Drain Line

B *Displacement*

022	22.1 cm³/rev [1.34 in³/rev]
026	26.2 cm³/rev [1.60 in³/rev]
033	33.1 cm³/rev [2.02 in³/rev]
038	37.9 cm³/rev [2.31 in³/rev]
044	44.1 cm³/rev [2.69 in³/rev]

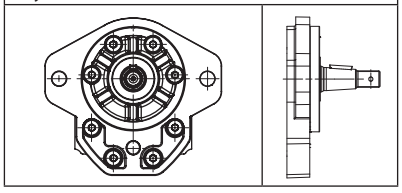
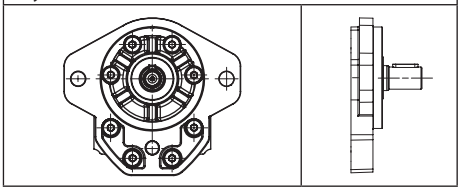
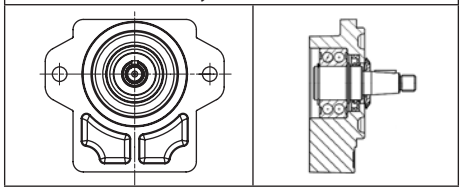
C *Sense of rotation*

R	Right (Clockwise)
L	Left (Counterclockwise)

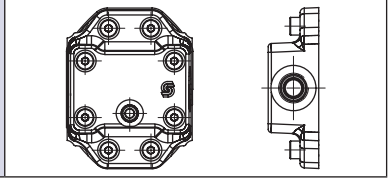
D *Version*

A	High-Temperature sealing, Dust protector, Rust protected screws

E *Mounting flange and shaft*

07BC	**07GB**	**9YDA**
SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts 1:8 Tapered shaft thread 5/8-18UNF, Key 6,375mm [0.25 in]	SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts - 22.225 mm parallel shaft L=25.4mm [1in] Key 6,375mm [0,25in]-Threaded hole 1/4-20 UNC	Outrigger Bearing with dust cover - SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts - 1:8 Tapered shaft thread 5/8-18UNF, Key 6,375mm [0.25 in]
		

F *Rear cover*

C6	Cast Iron cover with 1'-1/16 12 UN In-Out Ports - 9/16-18 UNF Axial Drain (idler gear side)
	

G *Inlet body port*

NN	No inlet in body

H *Outlet body port*

A3	25 x 26.19 x 52.37 x ⅜–16UNC	Flanged SAE port
C7	20 x 40 x M8	Flanged port, 4-threaded holes in + pattern, (European standard ports)
CA	27 x 51 x M10	
E6	1-1⁄16–12UN	Threaded SAE, O-ring boss port
F5	¾ Gas	Threaded Gas, (BSPP)
F6	1 Gas	

Model code (continued)

A			B			C	D		E			F	G		H		I		J	K		L			M	N
S	G	M	3	Y	N	/							N	N			N	N	N	N	/					

H *Outlet body port*

NN	No inlet in body

I *Outlet port position, variant body*

NN	Std motor - No outlet in body

J *Sealing*

N	Std High Temperature Seals

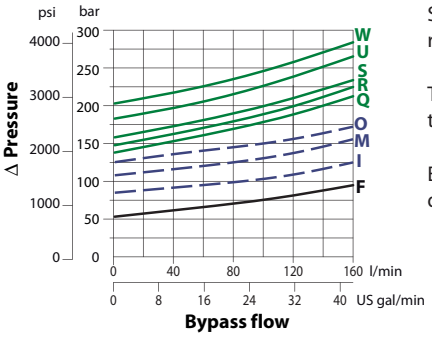
K *Screws*

N	Std Rust Protected Screws

L *Valve set*

XNN	No valve
XA*	Standard relief valve with coil voltage 12 V DC, DT connector
XB*	Standard relief valve with coil voltage 24 V DC, DT connector

X*F, X*I, X*M, X*O, X*Q, X*R, X*S, X*U, X*W



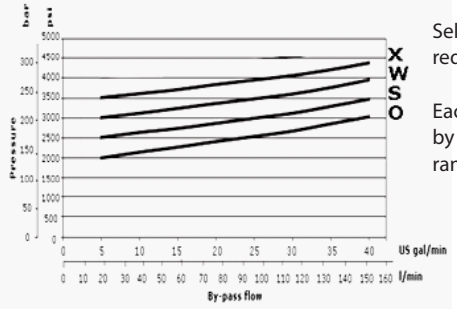
Select Pressure vs. Bypass flow requirements using the graph.

Three color curves represent three types of valves.

Each valve is characterized by different nominal spring ranges.

SA*	Flat curve valve with coil voltage 12 V DC, DT connector
SB*	Flat curve valve with coil voltage 24 V DC, DT connector

S*O, S*S, S*W, S*X



Select Pressure vs. Bypass flow requirements using the graph.

Each valve is characterized by different nominal spring ranges.

⚠ Caution

Maximum pressure setting will vary depending on pressure vs. bypass flow requirements.

M *Marking*

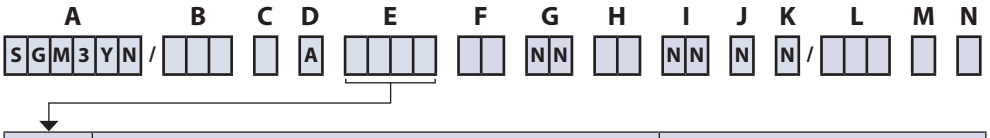
N	Standard marking
A	Standard + customer code
Z	Without marking
*	Special customer marking

N *Mark position*

N	Standard marking position
A	Idler gear side

Mounting flange and shaft options

Turolla OCG offers two types of industry standard mounting flanges. *The table below* shows order codes for each available mounting flange and its intended use:



Code	Shaft/Flange	Maximum torque
07BC	SAE B, pilot Ø 101.6 mm [Dia 4 in], 2-bolts Taper 1:8, 5/8–18UNF, Key 6.375 [0.25]	300 N•m [2655 lb•in]
07GB	SAE B, pilot Ø 101.6 mm [Dia 4 in], 2-bolts Parallel drive Ø 22.225 [Dia 0.875], L = 25.4 [1] ,Key 6.375 [0.25]	230 N•m [2036 lb•in]

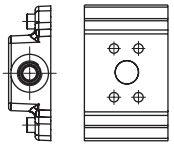
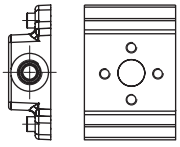
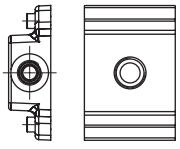
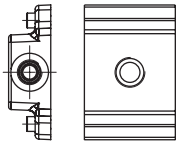
Spline configuration is not available for Group 2 fan drive motors. Other shaft options may exist. Contact your Turolla OCG representative for availability.

Caution

Shaft torque capability may limit allowable pressure. Torque ratings assume no external radial loading. Applied torque must not exceed these limits, regardless of stated pressure parameters. Maximum torque ratings are based on shaft torsional fatigue strength.

Outlet body port configuration

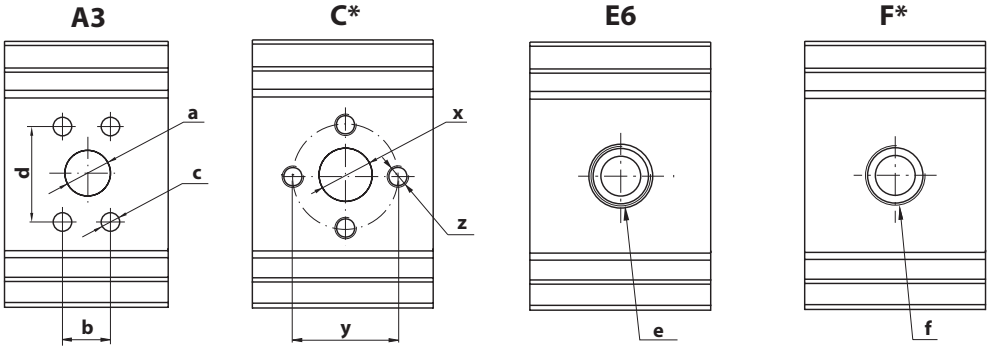
Standard Outlet port configuration availability

Code	*Outlet body description*	*Standard on flange/shaft*	*Inlet/Outlet port design*
A3	Flanged SAE port 25 x 26.19 x 52.37 x ⅜–16UNC	Non-standard	
C7	Flanged port, 4-threaded holes in + pattern, (European standard) 20 x 40 x M8	Non-standard	
CA	Flanged port, 4-threaded holes in + pattern, (European standard ports) 27 x 51 x M10		
E6	SAE, O-ring boss 1–1⁄16–12UN	Standard on 07BC, 07GB	
F5	Threaded ¾ GAS (BSPP)	Non-standard	
F6	Threaded 1 GAS (BSPP)		

Outlet body port (continued)

Outlet body port dimensions

Available ports for Group 3 fan drive motors



Group 3 fan drive motor port dimension (standard)

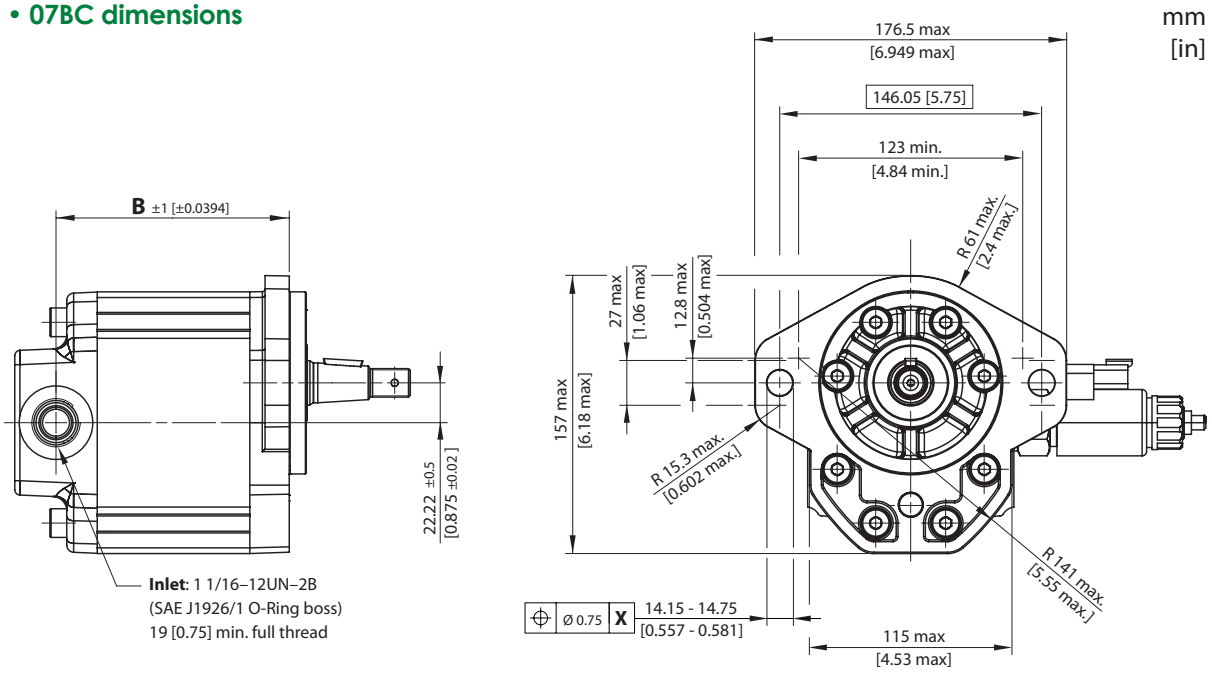
Standard outlet port		
Outlet port code		**E6**
Dimension		**e**
Frame size	**022**	1–1/16–12UN
	026	1–1/16–12UN
	033	1–1/16–12UN
	038	1–1/16–12UN
	044	1–1/16–12UN

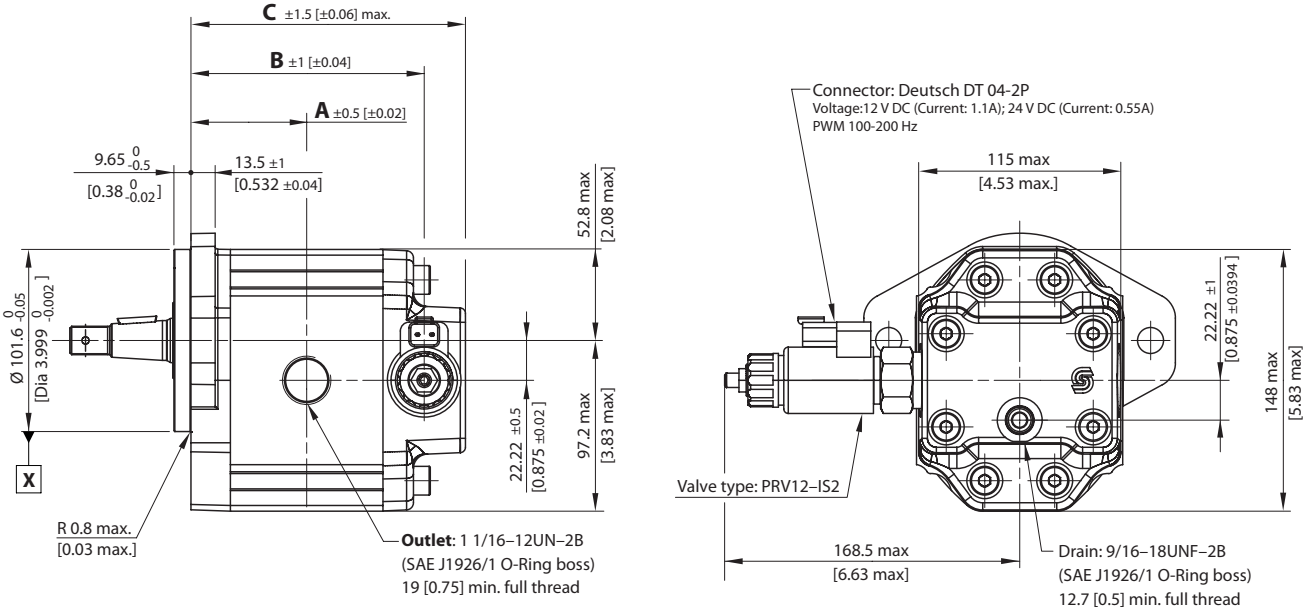
Group 3 fan drive motor port dimensions (non-standard)

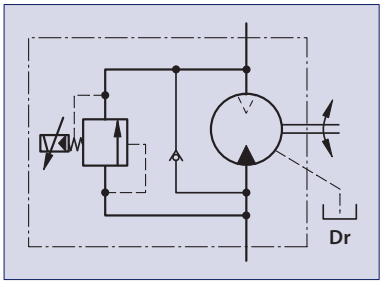
Non-standard outlet port													
Code	**A3**					**C***						**F***	
Frame size	**a**	**b**	**c**	**d**		**x**		**y**	**z**			**f**	
022	25.4 [1]	26.19 [1.03]	⅜–16UNC, min full thd. 20 [0.79] deep	52.37 [2.06]	*Outlet options*	**C7**	20 [0.79]	40 [1.58]	M8 min full thd. 12 [0.47] deep	*Outlet options*	**F5**	¾ Gas (BSPP)
026	25.4 [1]	26.19 [1.03]	⅜–16UNC min full thd. 20 [0.79] deep	52.37 [2.06]		**C7**	20 [0.79]	40 [1.58]	M8 min full thd. 12 [0.47] deep		**F5**	¾ Gas (BSPP)
033	25.4 [1]	26.19 [1.03]	⅜–16UNC min full thd. 20 [0.79] deep	52.37 [2.06]		**CA**	27 [1.06]	51 [2.0]	M10 min full thd. 17 [0.67] deep		**F6**	1 Gas (BSPP)
038	25.4 [1]	26.19 [1.03]	⅜–16UNC min full thd. 20 [0.79] deep	52.37 [2.06]		**CA**	27 [1.06]	51 [2.0]	M10 min full thd. 17 [0.67] deep		**F6**	1 Gas (BSPP)
044	25.4 [1]	26.19 [1.03]	⅜–16UNC min full thd. 20 [0.79] deep	52.37 [2.06]		**CA**	27 [1.06]	51 [2.0]	M10 min full thd. 17 [0.67] deep		**F6**	1 Gas (BSPP)

SGM3YN • 07BC dimensions

mm
[in]

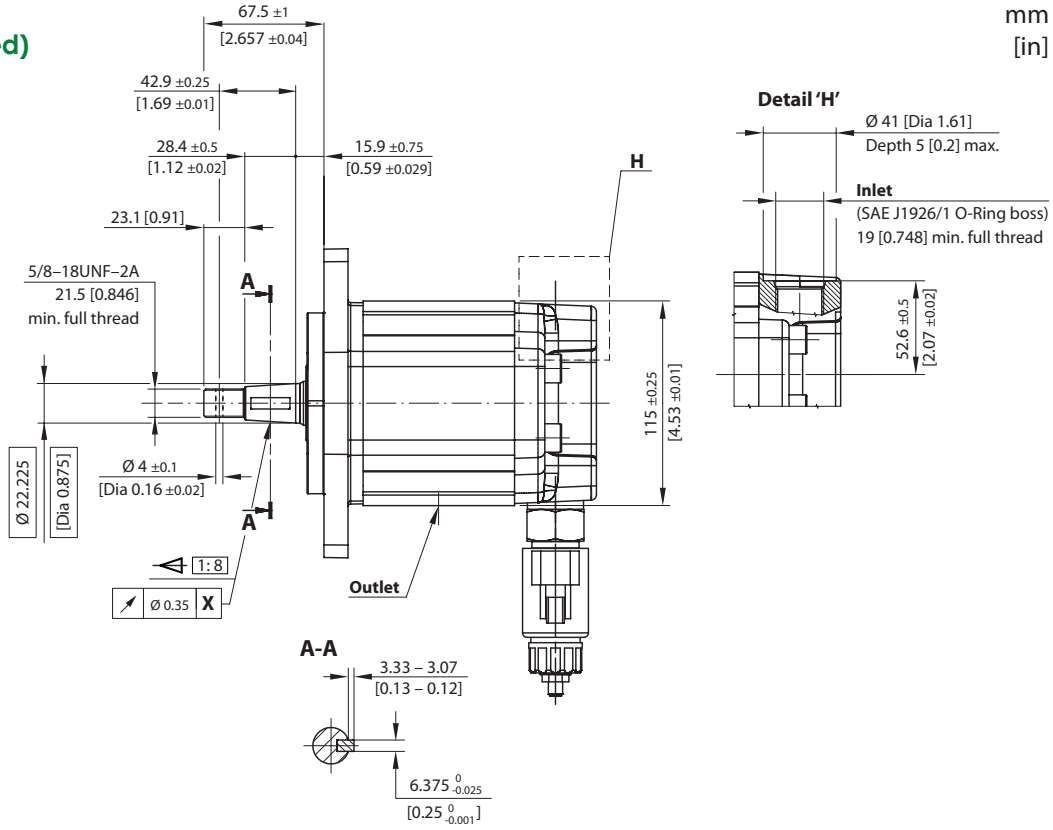






SGM3YN • 07BC dimensions (continued)

mm
[in]



SGM3YN – 07BC dimensions

Frame size	022	026	033	038	044
A	63 [2.48]	64.5 [2.54]	67 [2.64]	68.8 [2.71]	71 [2.8]
B	127.1 [5.04]	130.1 [5.12]	135.1 [5.32]	138.6 [5.46]	143.1 [5.63]
C	150.1 [5.91]	153.1 [6.03]	158.1 [6.22]	161.6 [6.36]	166.1 [6.54]
Inlet/Outlet	1–1/16–12UN–2B (SAE J1925/1, O-Ring boss); 19 [0.748] min. full thread				
Drain port	9/16–18UNF–2B (SAE J1925/1, O-Ring boss); 12.7 [0.5] min. full threads				

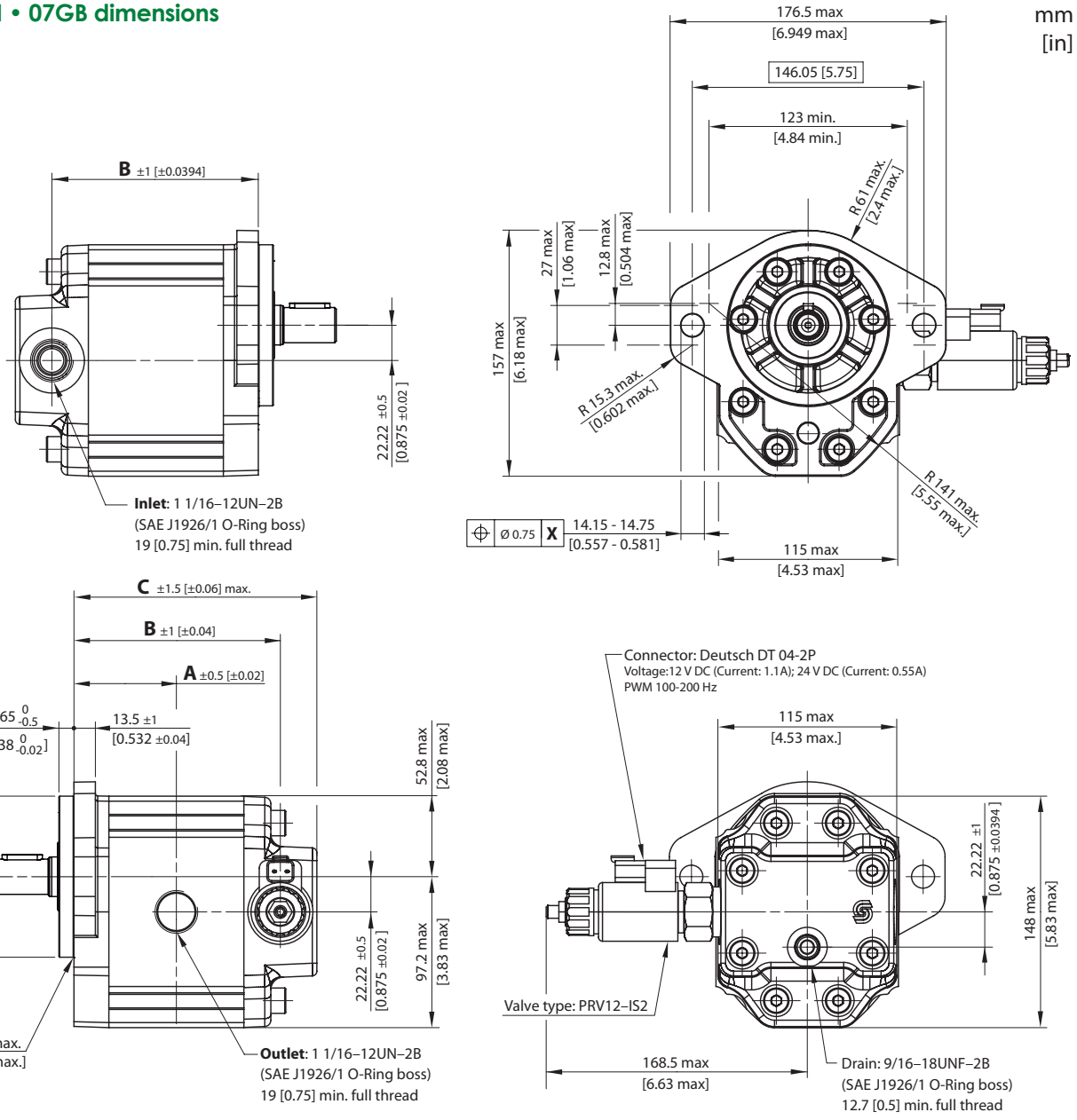
Model code example and maximum shaft torque

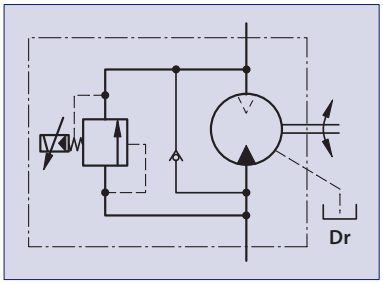
Flange/shaft	Model code example	Maximum shaft torque
07BC	SGM3YN/033LA07BCY6NNE6NNNN/XNNNN	300 N•m [2655 lb•in]

For further details on ordering, see *Model Code,* pages 60 and 61.

SGM3YN • 07GB dimensions

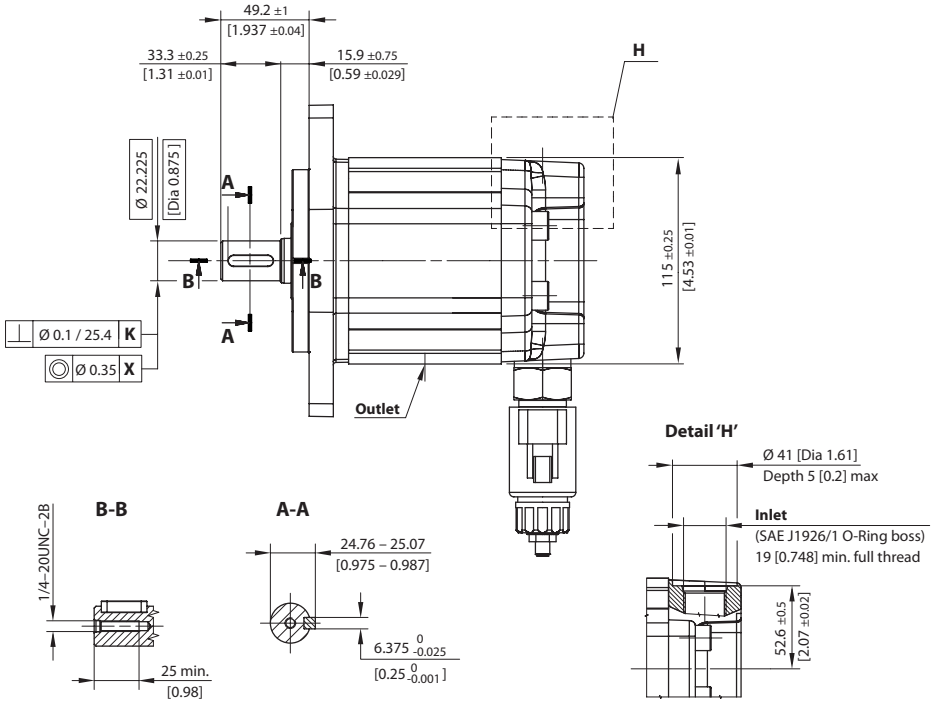
mm
[in]





SGM3YN • 07GB dimensions (continued)

mm
[in]



SGM3Y – 07GB dimensions

Frame size	022	026	033	038	044
A	63 [2.48]	64.5 [2.54]	67 [2.64]	68.8 [2.71]	71 [2.8]
B	127.1 [5.04]	130.1 [5.12]	135.1 [5.32]	138.6 [5.46]	143.1 [5.63]
C	150.1 [5.91]	153.1 [6.03]	158.1 [6.22]	161.6 [6.36]	166.1 [6.54]
Inlet/Outlet	1–1/16–12UN–2B (SAE J1925/1, O-Ring boss); 19 [0.748] min. full thread				
Drain port	9/16–18UNF–2B (SAE J1925/1, O-Ring boss); 12.7 [0.5] min. full threads				

Model code example and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
07GB	SGM3YN/022RA07GBY6NNE6NNNN/XNNNN	230 N•m [2036 lb•in]

For further details on ordering, see *Model Code,* pages 60 and 61.

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
Group 3 Fan Drive Gear Motors – SGM3VC

Motor design

SGM3VC

SGM3VC is Group 3 fan drive motor with integrated DCV valve for "reverse function", anti-shock and proportional relief valve. Inlet/outlet and radial drain line are on cast iron rear cover.

Displacement range from 22.1 cm^3/rev up to 44.1 cm^3/rev [from 1.34 in^3/rev up to 2.69 in^3/rev].

Configurations include European and SAE flanges; taper 1:8, taper 1:5 and parallel Ø15.875 mm [Dia 0,62 in] shafts.

Outrigger bearing available as SAE A flange with taper shaft 1:8 and European flange with taper shaft 1:5.

SGM3VC

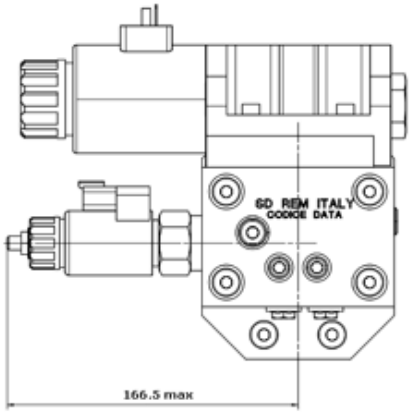
Technical data

Technical data for SGM3VC standard fan drive gear motors

Frame size		022	026	033	038	044
Displacement	cm^3/rev [in^3/rev]	22.1 [1.34]	26.2 [1.60]	33.1 [2.02]	37.9 [2.31]	44.1 [2.69]
Peak pressure	bar [psi]	270 [3916]	270 [3916]	270 [3916]	270 [3916]	270 [3916]
Rated pressure		250 [3626]	250 [3626]	250 [3626]	250 [3626]	250 [3626]
Back pressure		150 [2176]	150 [2176]	150 [2176]	150 [2176]	150 [2176]
Maximum speed	min^{-1} (rpm)	2500	2500	2500	2500	2300
Minimum speed		800	800	800	800	800
Weight	kg [lb]	16.32 [35.80]	16.42 [36.20]	16.52 [36.42]	16.62 [36.64]	16.72[36.86]
Moment of inertia of rotating components	x 10^{-6} kg•m^2 [x 10^{-6} lbf•ft^2]	198 [4699]	216 [5126]	246 [5838]	267.2 [6341]	294.2 [6981]

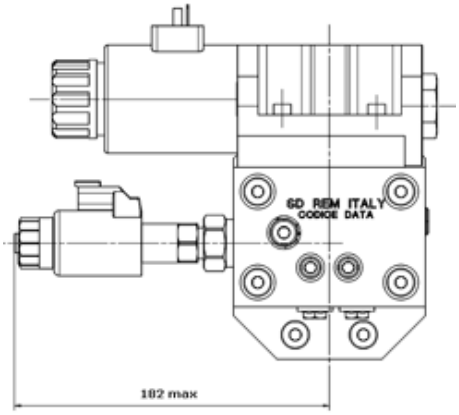
Technical data (continued)

Electro proportional relief valve standard and D03 directional valve



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 7.2 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 28.8 Ω @ 20 °C [68 °F]
Directional valve coil	12 - 24 V DC
PWM frequency	from 100 to 200 Hz

Electro proportional relief valve flat curve and D03 directional valve



Electrical connectors	Deutsch DT 04-2P connectors (Protection rate IP 69K DIN 40050)
Electrical supply to EH valve	0 to 1.1 A @ 12 V DC, with coil resistance of 6.4 Ω @ 20 °C [68 °F]
	0 to 0.55 A @ 24 V DC, with coil resistance of 26.2 Ω @ 20 °C [68 °F]
Directional valve coil	12 - 24 V DC
PWM frequency	from 100 to 250 Hz

SGM2 and SGM3 Fan Drive Gear Motors
Technical Information
SGM3VC – Group 3 Fan Drive Gear Motors

Model code

A				B			C	D	E			F		G		H		I		J	K		L			M	N
S	G	M	3	V	C	/								N	N	N	N	N	N	N	N	/					

A *Type*

SGM3VC	Group 3 Fan Drive Motor with EH Proportional Reverse Control ; Inlet-Outlet on Cast Iron Cover - Radial Drain

B *Displacement*

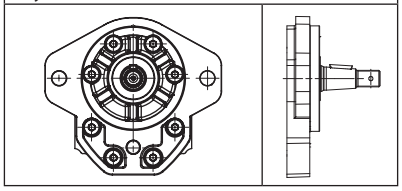
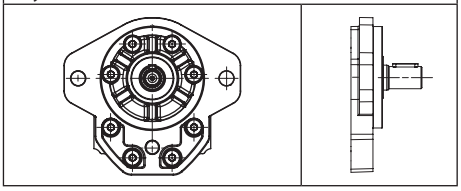
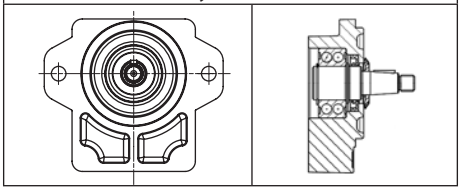
022	22.1 cm³/rev [1.34 in³/rev]
026	26.2 cm³/rev [1.60 in³/rev]
033	33.1 cm³/rev [2.02 in³/rev]
038	37.9 cm³/rev [2.31 in³/rev]
044	44.1 cm³/rev [2.69 in³/rev]

C *Sense of rotation*

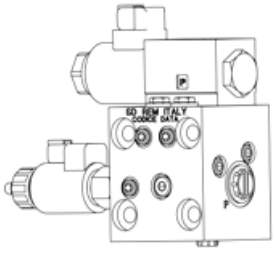
R	Right (Clockwise) with Left Hand Reversing-Drain on Drive gear side
L	Left (Counterclockwise) with Right Hand Reversing-Drain on Idler gear side

D *Version*

E *Mounting flange and shaft*

07BC	07GB	9YDA
SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts 1:8 Tapered shaft thread 5/8-18UNF, Key 6,375mm [0.25 in]	SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts - 22.225 mm parallel shaft L=25.4mm [1in] Key 6,375mm [0,25in]-Threaded hole 1/4-20 UNC	Outrigger Bearing with dust cover - SAE B flange pilot Ø101,6 [Dia 4 in] 2-bolts - 1:8 Tapered shaft thread 5/8-18UNF, Key 6,375mm [0.25 in]
		

F *Rear cover*

RA	Proportional PRV Reversing Valve Cover, 12 V DCV03 Deutsch connector, Anti-Shock-MakeUp Valve, 1'-1/16 12UN Work Ports, 9/16-18UNF Radial Drain Port	
RB	Proportional PRV Reversing Valve Cover, 24 V DCV03 Deutsch connector, Anti-Shock-MakeUp Valve, 1'-1/16 12UN Work Ports, 9/16-18UNF Radial Drain Port	

G *Inlet body port*

NN	No inlet in body

Model code (continued)

A			B			C	D		E			F	G		H		I		J	K		L			M	N
S	G	M	3	V	C	/							N	N	N	N	N	N	N	N	/					

H *Outlet body port*

NN	No inlet in body

J *Sealing*

N	Std High Temperature Seals

I *Outlet port position, variant body*

NN	Std motor - No outlet in body

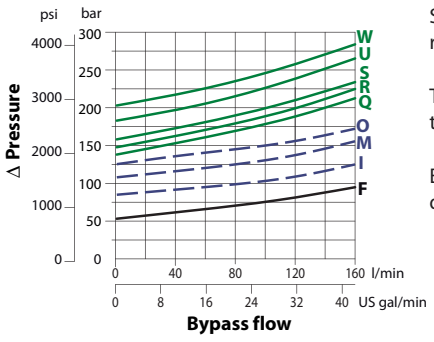
K *Screws*

N	Std Rust Protected Screws

L *Valve set*

XNN	No valve
XA*	Standard relief valve with coil voltage 12 V DC, DT connector
XB*	Standard relief valve with coil voltage 24 V DC, DT connector

X*F
X*I
X*M
X*O
X*Q
X*R
X*S
X*U
X*W



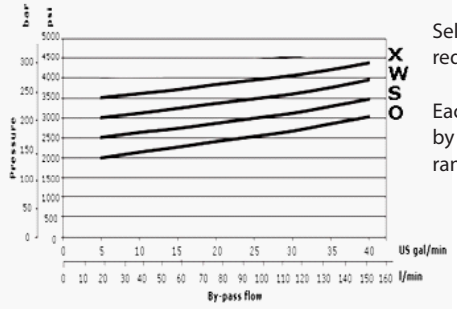
Select Pressure vs. Bypass flow requirements using the graph.

Three color curves represent three types of valves.

Each valve is characterized by different nominal spring ranges.

SA*	Flat curve valve with coil voltage 12 V DC, DT connector
SB*	Flat curve valve with coil voltage 24 V DC, DT connector

S*O
S*S
S*W
S*X



Select Pressure vs. Bypass flow requirements using the graph.

Each valve is characterized by different nominal spring ranges.

⚠ Caution

Maximum pressure setting will vary depending on pressure vs. bypass flow requirements.

M *Marking*

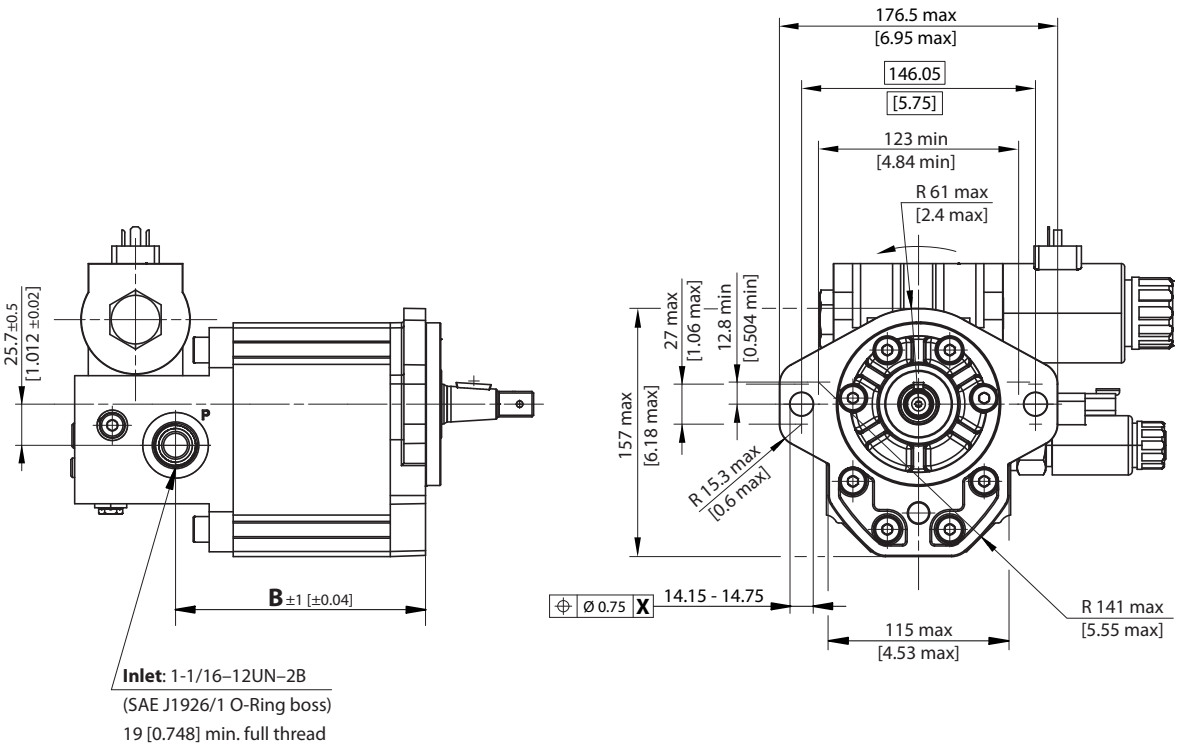
N	Standard marking
A	Standard + customer code
Z	Without marking
*	Special customer marking

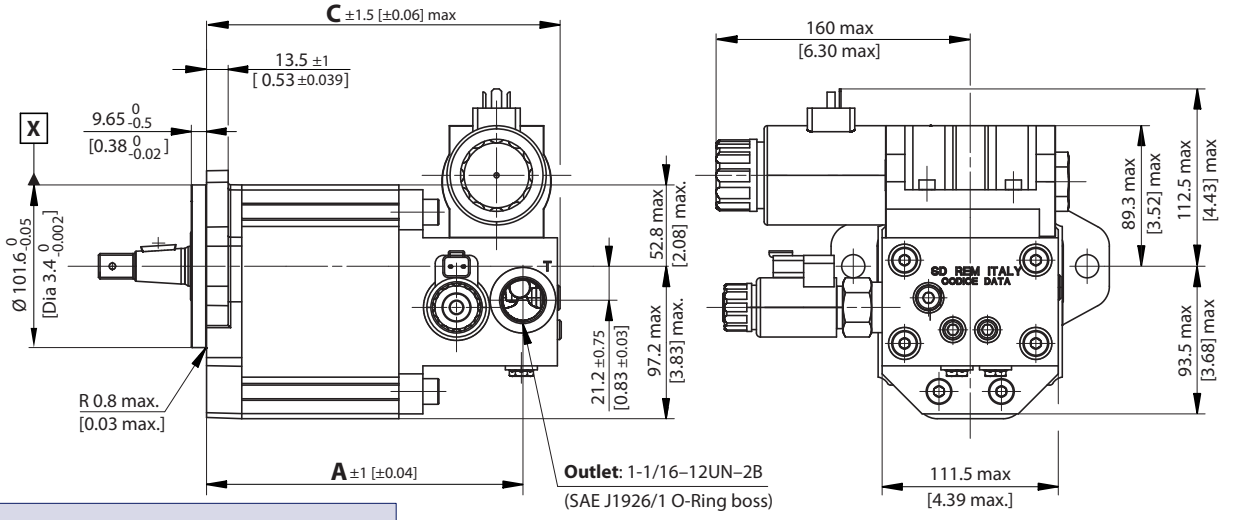
N *Mark position*

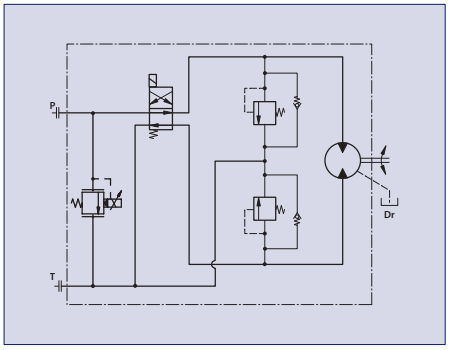
N	Standard marking position
A	Idler gear side

SGM3VC • 07BC dimensions

mm
[in]

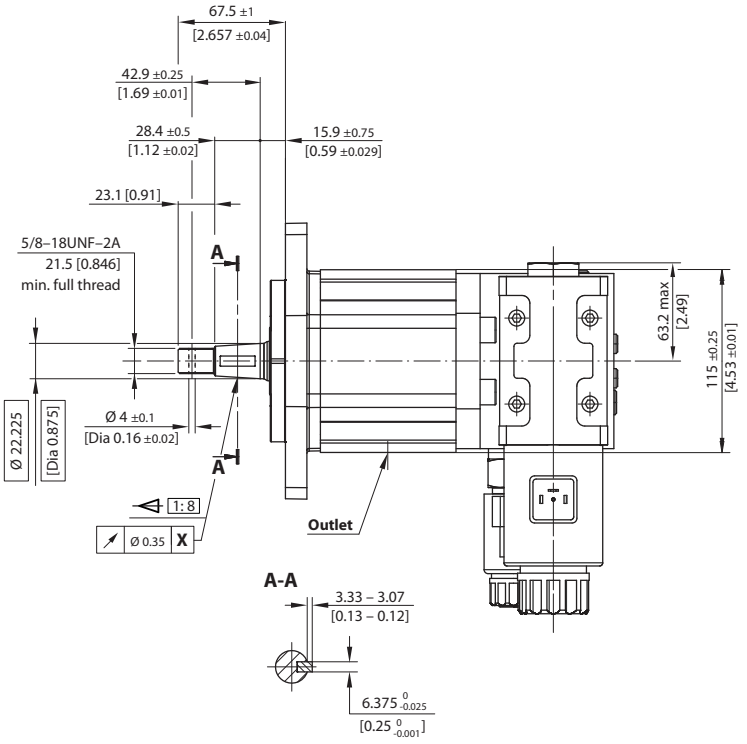






SGM3VC • 07BC dimensions (continued)

mm
[in]



SGM3VC – 07BC dimensions

Frame size	022	026	033	038	044
A (inlet)	181.6 [7.15]	184.6 [7.27]	189.6 [7.46]	193.1 [7.62]	197.6 [7.78]
B (inlet)	140.1 [5.52]	143.1 [5.63]	148.1 [5.83]	151.1 [5.95]	156.1 [6.15]
C (overall)	204.8 [8.06]	207.8 [8.18]	212.8 [8.38]	216.3 [8.52]	220.1 [8.67]
D (drain)	149.1 [5.87]	152.1 [5.99]	157.1 [6.19]	160.6 [6.32]	165.1 [6.50]
Inlet/Outlet	1–1/16–12UN–2B (SAE J1925/1, O-Ring boss); 19 [0.748] min. full thread				
Drain port	9/16–18UNF–2B (SAE J1925/1, O-Ring boss); 12.7 [0.5] min. full threads				

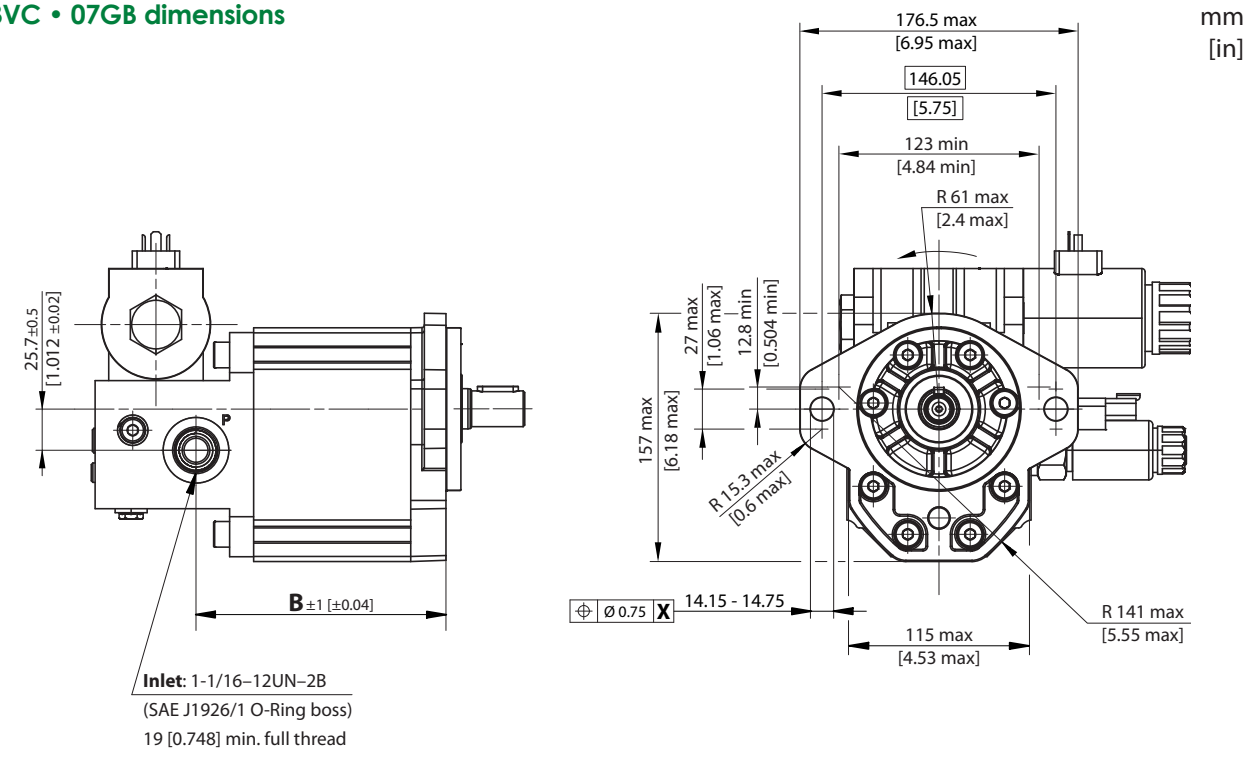
Model code example and maximum shaft torque

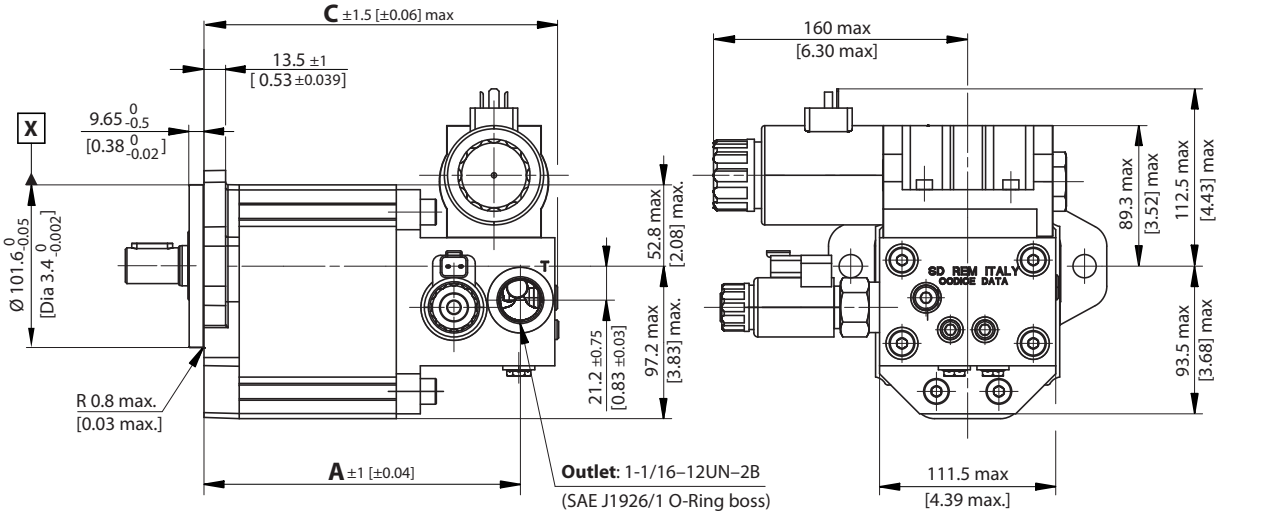
Flange/drive gear	Model code example	Maximum shaft torque
07BC	SGM3VC/033LA07BCYENNE6NNNN/XNNNN	230 N•m [2036 lb•in]

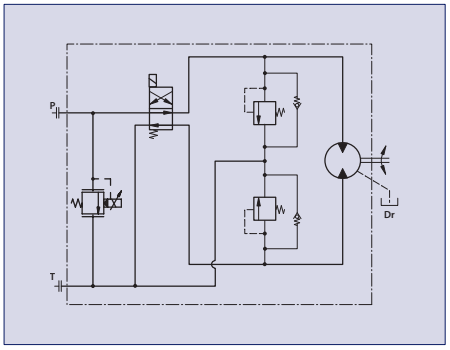
For further details on ordering, see *Model Code,* page 70 and 71.

SGM3VC • 07GB dimensions

mm
[in]

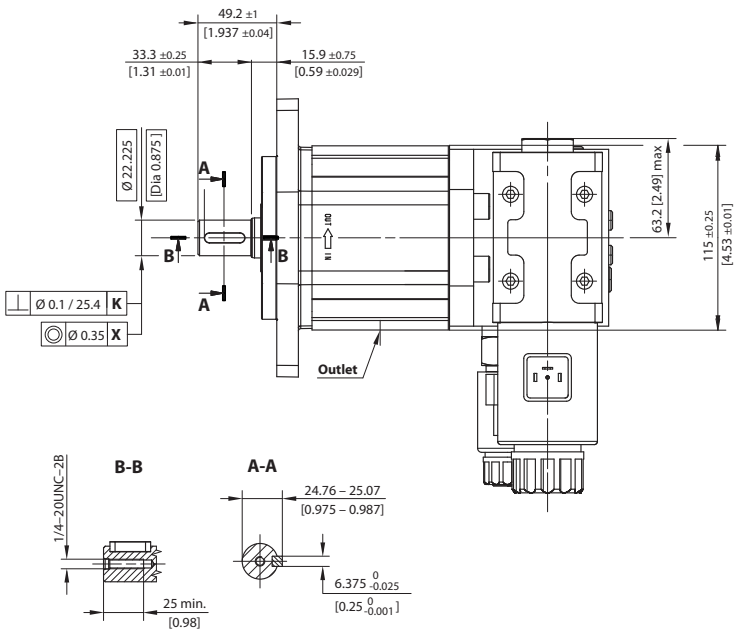






SGM3VC • 07GB dimensions (continued)

mm
[in]



SGM3VC – 07GB dimensions

Frame size	022	026	033	038	044
A (inlet)	181.6 [7.15]	184.6 [7.27]	189.6 [7.46]	193.1 [7.62]	197.6 [7.78]
B (inlet)	140.1 [5.52]	143.1 [5.63]	148.1 [5.83]	151.1 [5.95]	156.1 [6.15]
C (overall)	204.8 [8.06]	207.8 [8.18]	212.8 [8.38]	216.3 [8.52]	220.1 [8.67]
D (drain)	149.1 [5.87]	152.1 [5.99]	157.1 [6.19]	160.6 [6.32]	165.1 [6.50]
Inlet/Outlet	1–1/16–12UN–2B (SAE J1925/1, O-Ring boss); 19 [0.748] min. full thread				
Drain port	9/16–18UNF–2B (SAE J1925/1, O-Ring boss); 12.7 [0.5] min. full threads				

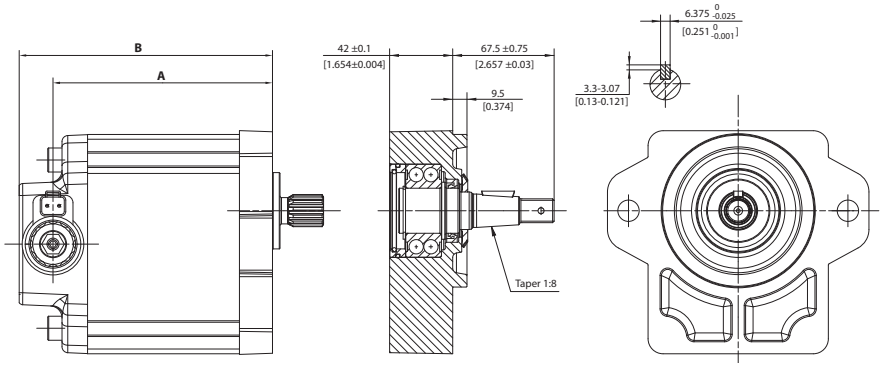
Model code example and maximum shaft torque

Flange/drive gear	Model code example	Maximum shaft torque
07GB	SGM3VC/022RA07GBY6NNE6NNNN/XNNNN	230 N•m [2036 lb•in]

For further details on ordering, see *Model Code,* page 70 and 71.

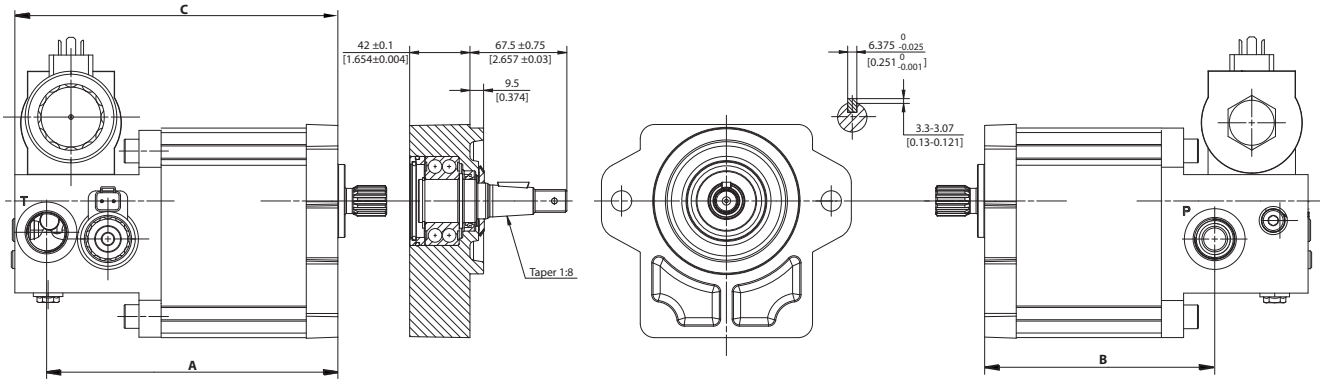
Outrigger bearing

SGM3NC and SGM3YN dimensions



Frame size		022	026	033	038	044
Dimension	A	127.1 [5.04]	130.1 [5.12]	135.1 [5.32]	138.6 [5.46]	143.1 [5.63]
	B	150.1 [5.91]	153.1 [6.03]	158.1 [6.22]	161.6 [6.36]	166.1 [6.54]

SGM3VC dimensions



Frame size		022	026	033	038	044
Dimension	A (inlet)	181.6 [7.15]	184.6 [7.27]	189.6 [7.46]	193.1 [7.60]	197.6 [7.78]
	B (outlet)	140.1 [5.52]	143.1 [5.63]	148.1 [5.83]	151.1 [5.95]	156.1 [6.15]
	C (overall)	204.8 [8.06]	207.8 [8.18]	212.8 [8.38]	216.3 [8.52]	220.1 [8.67]

Notes

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