

High Speed Spindl-Gard®

The High-Speed Spindl-Gard® System is today's highly efficient, cost-effective method for lubricating spindle bearings, using air/oil technology.

DESCRIPTION

The High-Speed Spindl-Gard System applies a constant, every minute, quantity of oil directly to the rotating bearing elements. The system is recommended for bearings that operate at speeds greater than 250,000 DN (Bearing Bore in mm X RPM).

The **New** High Speed Spindl-Gard System incorporates proven high-speed air/oil spindle lubrication technology into a complete package. Components include an electric motor driven pump, with 3 liter (0.8 gallon) plastic reservoir, air/oil dispensing module, and an optional programmable timer/controller (AC models only).

The package (figure 1) is designed to lubricate from 1 to 8 bearings. Each bearing point will typically utilize an air/oil-mixing block. Unit can be expanded up to 8 mixing blocks. Each bearing point is supplied from a mixing block that includes a piston distributor, an air/oil-mixing chamber and an independent air flow adjustment. Three different oil outputs are offered 0.025, 0.049, or 0.082 cc (0.0015, 0.003, or 0.005 cu. in.) at 2.5 to 20 minute intervals.

The system is designed to deliver from 16L (0.57 SCFM) of air @ 2 bar (30 psi) (with a .8mm (0.030 in.) orifice) per point to 104L (3.67 SCFM) of air @ 4.1 bar (60 psi) (with a 1.5mm (0.060 in.) orifice) per point.

FEATURES/BENEFITS

- Advanced air/oil concept provides highly effective lubrication, reduces oil consumption, lowers operating temperature and protects spindle bearings from coolant ingress.
- Thin oil film dramatically reduces viscous shear and hydrodynamic drag on the bearing, resulting in reduced friction and lower energy consumption.
- Integral package design allows for ease of installation.
- Airflow adjustment for each bearing point.
- Oil output selectable for each bearing point.



Figure 1

- Eliminates the clean up and environmental problems that result from mist systems.
- Overall package dimensions: 415cm x 394cm x 157cm (16.2" high x 15.5" wide x 6.2" deep).
- Integral monitoring of air pressure, lube pressure and oil level.
- Air/oil lubrication lowers operating temperature which minimizes thermal distortion resulting in improved production accuracy.

OPERATION

Air is constantly being applied to the air/oil block(s). After a preset time, the controller activates the pump, which builds system pressure and fires the Piston Distributors within the air/oil blocks. The output from the piston distributor is discharged to the air/oil-mixing chamber where the constant flow of air causes a thin film of oil to flow along the delivery tube ID [.6m (2-ft.) min. length] in a constant wave like motion. This film is then applied in the form of a very fine spray from a drilled orifice or an SPG-2 nozzle tube to the bearing elements on a constant basis.

The optional Spindl-Gard system controller provides monitoring for low air pressure, low oil pressure, and low oil level. Should any of the built in sensors indicate a fault condition, the red LED on the pump illuminates and the fault relay changes state. The fault relay can be connected to an external alarm or directly to the spindle drive control for shutdown as desired by user.

SPECIFICATIONS	
Pump Output	8.5 in ³ /min (140 cc/min)
Motor Power	1/8 HP
Motor Voltage & Current Consumption	115 ± 10% VAC, 50/60 Hz, 1 ph, 3.8A in-rush, 1.8A running 230 ± 10% VAC, 50/60 Hz, 1 ph, 1.9A in-rush, 0.94A running 24VDC, 60w
Pressure Relief Setting	350 psi (34 bar)
Output Block Regulator	30-60 psi (2.07-4.14 bar)
Lubricant	Oils up to ISO 460 (2500 SUS)
Seals	Buna-N O-Rings
Plastic Reservoir	0.8 gal (3 liters)
Low-Level	N.C. (held open), 115/230 VAC, 10 watt
Controls Options	
Remote (External Control or Customer PLC)	115/230 VAC, 1 ph, 50/60 Hz, 24 VDC
*AC Timer	115/230 VAC, 1 ph, 50/60 Hz
Work (On) Time	5-20 sec
Pause (Off) Time	2.5-30 min
Fault Output	(Dry Contacts), 5 amp max up to 230 VAC
Air Cleanliness	5 micron, 40°F (4°C) Dewpoint
Operating Temperature	40°F to 120°F (4°C to 49°C)
Lube Output	0.0015, 0.0030 & 0.005 cu in/cycle (0.025, 0.049 & 0.082 cc/cycle)
Pressure Switch Set Points	
Air (N.C.)	25 psi (1.7 bar), nonadjustable
Oil (N.O.)	320 psi (22 bar), nonadjustable
Nozzles	Tube ID/Orifice Ratio (See Figure 2)
Delivery Tube Length	24 in to 50 ft (0.6 m to 15.24 m)
Lubricant Filtration	It is recommended that the lubricant in any lubrication system be filtered to the minimum level recommended by the Society of Automotive Engineers (SAE) which corresponds to the ISO Standard 4460 ratings/specifications of ISO 18/14

ORDERING INFORMATION

Spindl-Gard Ordering Menu Code

SPG -	X	-	X	-	XXX	-	X	-	X
TYPE OF PUMP									
M - MOTOR									
CONTROLLER OPTION									
0 - REMOTE (NO TIMER)									
1 - WITH TIMER (AC MODELS ONLY)									
VOLTAGE									
024 - 24 VDC									
115 - 115 VAC									
230 - 230 VAC									
NUMBER OF OUTLETS									
1 - ONE									
2 - TWO									
3 - THREE									
4 - FOUR									
5 - FIVE									
6 - SIX									
7 - SEVEN									
8 - EIGHT									
INDIVIDUAL OUTPUTS FROM INLET TO END CC/STROKE (CU IN/STROKE)									
0 - PLUGGED									
1 - 0.025 (0.0015)									
3 - 0.049 (0.0030)									
5 - 0.082 (0.0050)									

Air Flow Data Chart

The velocity of the air is critical for proper oil transportation from the air/oil dispensing block to the bearing. The velocity of the air depends on the air pressure, the orifice size and the tubing size. For spindle applications a .76mm (0.030 in.) orifice with 5mm (3/16") O.D. (3mm (1/8") ID) tube are typically used. The following chart lists other orifice and delivery tube sizes. The resulting air flows are also shown for estimating system air flow requirements.

Orifice Size Mm (inches)	Delivery Tube O.D. Mm (inches)	Delivery Tube I.D. Mm (inches)	Air Flow @ 30 psi LPM (SCFM)	Air Flow @ 60 psi LPM (SCFM)
.76 (0.030)	5 (3/16)	3 (1/8)	16.1 (0.570)	25.2 (0.890)
1.00 (0.040)	6 (1/4)	4 (3/16)	27.7 (0.980)	45.3 (1.600)
1.27 (0.050)	(5/16)	(1/4)	48.4 (1.710)	81.5 (2.880)
1.52 (0.060)	8 (5/16)	6 (1/4)	61.7 (2.180)	103.9 (3.670)

Figure 2

Note: Refer to Spindle-Gard Installation and Operation document number 600-044-872 (shipped with unit) for wiring, start-up and installation details. See Spindle-Gard bulletins L20110 and L42110 for additional system components and nozzle positioning instructions. Also see bulletin L12606 for additional details on EO-3 pumps.

HIGH SPEED SPINDL-GARD ORDERING INFORMATION		
Description	Part No.	Old Part No.
0.025 (0.0015) Block Assembly	563130	484-095-228
0.025 (0.0015) Displacement Cap	560264	437-701-152
0.049 (0.0030) Block Assembly	563131	484-095-229
0.049 (0.0030) Displacement Cap	560265	437-701-153
0.082 (0.0050) Block Assembly	563132	484-095-230
0.082 (0.0050) Displacement Cap	560266	437-701-154
Zero Displacement Cap	—	437-701-155
Displacement Cap O-Ring	556567	422-210-030
10 Micron Oil Filter	563489	527-006-710
24 VDC w/out Timer	247655	126-410-049
115 VAC w/out Timer	247654	126-410-021
115 VAC w/Timer	247652	126-410-017
230 VAC w/out Timer	247669	126-410-026
230 VAC w/Timer	247653	126-410-018

SYSTEM DIMENSIONS Inches (cm)

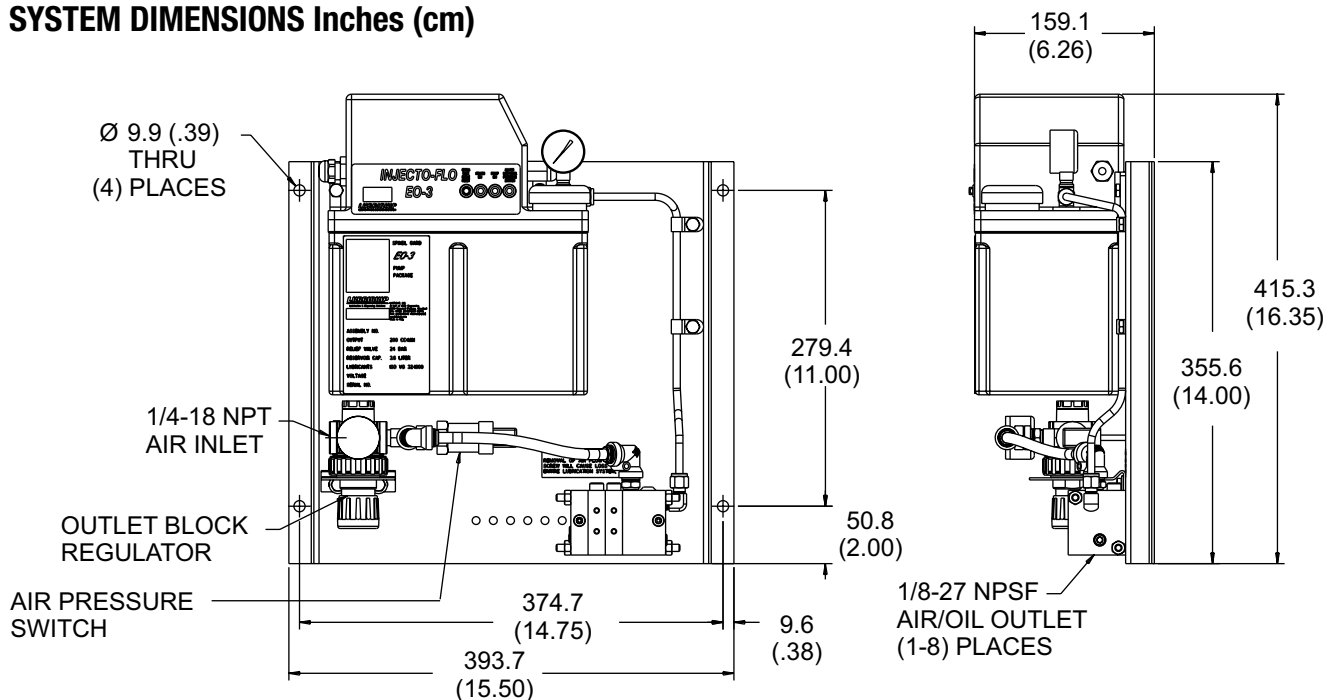


Figure 3

BLOCK & TIE ROD ASSEMBLY

DIMENSIONS Mm (inches)

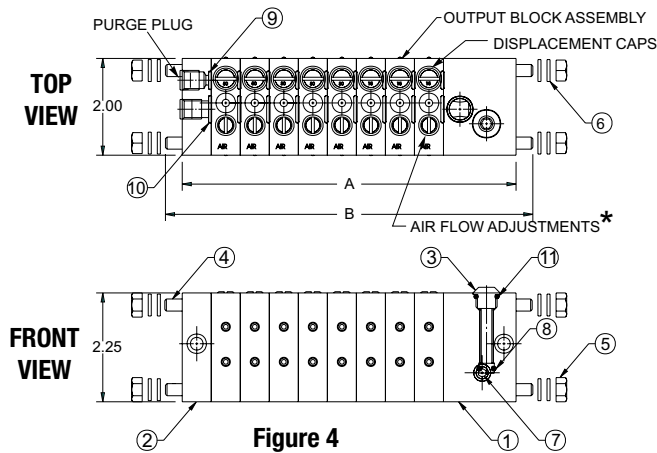


Figure 4

TABLE 1 ORDERING INFORMATION

Description	Part No.	Old Part No.
(1) Inlet Block	561031	527-301-132
(2) End Block	561032	527-301-133
(3) Filter Assembly	563489	527-006-710
(4) 2 Tie Rods	—	See Table 2
(5) 4 1/4 Hex Nuts	—	See Table 2
(6) * 1/4 Lock Washer	—	See Table 2
(7) 1/16 Pipe Plug	555456	412-700-347
(8) O-Ring	556542	422-010-080
(9) O-Ring	555645	422-010-100
(10) O-Ring	555647	422-010-130
(11) O-Ring	556568	422-210-040

*The airflow adjustment screw is full open when the top of the screw is flush with the top of the block. To restrict airflow turn clockwise.

TABLE 2 BLOCK ASSEMBLY COMPONENT ORDERING INFORMATION

Points	Output Blocks	No. of Washers	Dim "A" in (cm)	Dim "B" in (cm)	Part No.	Old Part No.
1	1	8	2.70 (6.80)	3.75 (9.53)	564443	560-002-951
2	2	0	3.30 (8.38)	3.75 (9.53)	563940	560-002-952
3	3	4	3.90 (9.91)	4.83 (10.92)	564444	560-002-953
4	4	0	4.50 (11.43)	4.91 (12.47)	—	560-002-954
5	5	0	5.10 (12.95)	5.75 (14.61)	—	560-002-955
6	6	8	5.70 (14.48)	6.67 (16.94)	563941	560-002-956
7	7	0	6.30 (16.00)	6.72 (17.07)	563942	560-002-957
8	8	0	6.90 (17.53)	7.59 (19.28)	Disc.	560-002-958

TABLE 3 VOLUME OUTPUT PER STROKE ORDERING INFORMATION

Output (cu.in.)	Output (cc)	Part No.	Old Part No.
0.0015	0.025	563130	484-095-228
0.0030	0.049	563131	484-095-229
0.0050	0.082	563132	484-095-230

ACCESSORIES

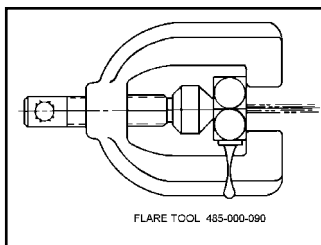


Figure 5

Note: Flare Tool: 45° SAE 0.149 inch (3.8 mm) OD Tubing Flare with special tube clamp for precise nozzle tube flaring.

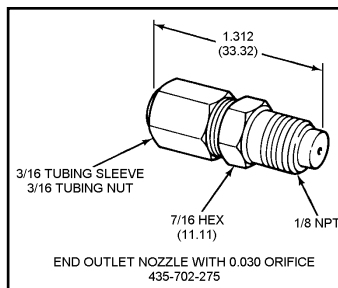


Figure 6

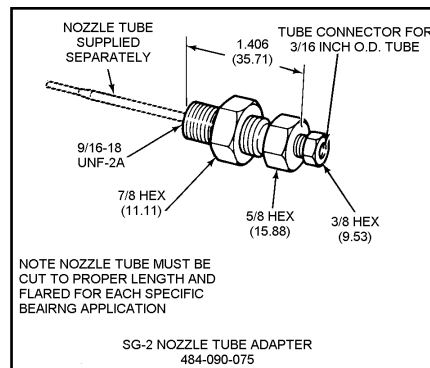


Figure 7

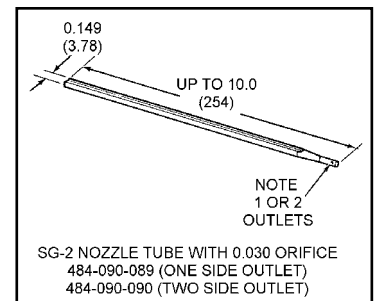


Figure 8

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