GOPHER
Speed Controlled Rotary Cleaning for Straight Tubes

1.6 in. 42 mm

7.8 in. 200 mm

9/16 MP
9/16 HP

The Gopher self-rotary tool is ideal for cleaning evaporator tubes and liquor lines. It has the power to cut through coke, polymers, coatings and latex — anything clogging tubes or pipes as small as 2 inches (50 mm) in diameter. The Gopher is offered in two pressure ranges up to 40,000 psi (2800 bar).

The Gopher can be paired with the Sabertooth automated tube cleaning system to facilitate hands-free lancing of large diameter tubes such as those found in industrial evaporators and condensers.

COMPETITIVE ADVANTAGES

- Low cost high pressure seats and seals and common ATF fluid for ease of maintenance
- Simple nozzle changes allow you to match all cleaning applications
- Different heads match a wide range of flow options, allowing the operator the ability to switch from different pumps
- External port plug allows for fluid refill without tool disassembly

FEATURES	BENEFITS
• Self-rotary, speed controlled	• Rotary tools provide complete internal coverage while speed control provides optimum jet delivery
• Two head options	• 7-port unplugging option for maximum forward hitting power and a 6-port polishing head for IRIS inspection polishing
• Multiple jetting configurations	• Same tool can be re-jetted to match a wide variety of cleaning applications — great for when you need more pulling force or forward hitting power

QUESTIONS TO ASK YOUR CUSTOMER

- What size and length of hose are you using?

- What pressure and flow are you operating?

- Do you need an adapter?

- Do you need a backout preventer?
  You should always use a backout preventer with high pressure pipe cleaning tools.

- Do you need a centralizer or stinger?

TOOL SPECIFICATIONS

MODEL	GO-MP9	GO-H9-C
Pressure Range	2–22k psi 140–1500 bar	22k–40k psi 1500–2800 bar
Flow Range	8–25 gpm 30–95 l/min	4–10 gpm 15–40 l/min
Flow Coefficient	0.84 Cv	0.30 Cv
Rotation Speed	600–1000 rpm	600–1000 rpm
Inlet Connection	9/16 MP	9/16 HP
Port Size	1/8 NPT (P2)	1/4-28 UNF (S4)
Nozzle Type	AP2	OS4
Port Plug	GP 025-P2SS	OS4 002
Swivel Diameter	1.6 in. 42 mm	1.6 in. 42 mm
Swivel Length	7.8 in. 200 mm	7.8 in. 200 mm
Swivel Weight	2.3 lb 1.0 kg	2.6 lb 1.2 kg
Head Weight	0.60–0.75 lb 0.27–0.34 kg	0.60–0.75 lb 0.27–0.34 kg
Maximum Water Temperature	160 ºF 70 ºC	160 ºF 70 ºC

Visit the StoneAge Dealer Portal for tool resources
including sales, operation and maintenance videos:
DEALER.STONEAGETOOLS.COM

GOPHER TOOL CONFIGURATION

Hose Adapter,
if required

Swivel

Nozzle   Head
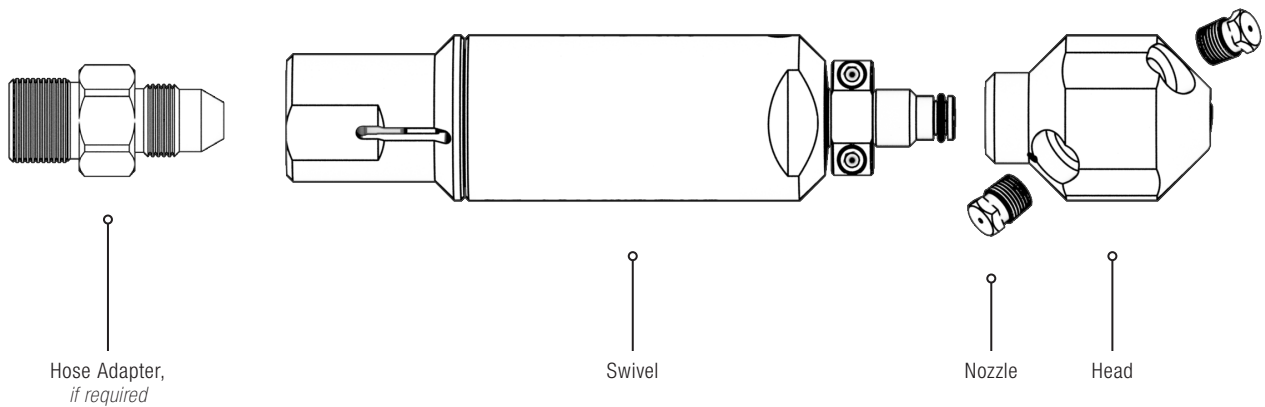
A complete Gopher tool configuration requires the following components:

1. Swivel for required working pressure
2. Head for required pressure, flow and application
3. Nozzles/Plugs of appropriate number and size

The following items may also be required:

*   Suitable hose/lance adapter
*   Centralizer

To configure a Gopher tool, the following information should be obtained:

*   Pump pressure and flow
*   Hose length and ID
*   Hose end fitting

GOPHER TOOL CONFIGURATION

ORDERING A STANDARD PACKAGE

StoneAge offers standardized Gopher tool packages for the most commonly used configurations. These packages come fully assembled and include: 1. Swivel, 2. Head, and 3. Nozzles specified to jetting.

PLEASE NOTE: Hose/lance adapters are not included in these packages. If an adapter is required for your configuration, it must be ordered separately. See Fittings and Adapters for options.

The following table shows the configurations of standard Gopher tool packages:

MAXIMUM PRESSURE	HEAD TYPE	PACKAGE CONTENTS	PACKAGE PART ID
22k psi 1500 bar	Polisher	1 x 22k psi/1500 bar Gopher swivel 1 x Polisher head 6 x AP2 Attack Tip nozzles/plugs	GO-MP9-POL-PKG
	Unplugger	1 x 22k psi/1500 bar Gopher swivel 1 x Unplugger head 5 x AP2 Attack Tip nozzles/plugs	GO-MP9-UNP-PKG
40k psi 2800 bar	Polisher	1 x 40k psi/2800 bar Gopher swivel 1 x Polisher head 6 x OS4 Sapphire nozzles/plugs	GO-H9-C-POL-PKG
	Unplugger	1 x 40k psi/2800 bar Gopher swivel 1 x Unplugger head 5 x OS4 Sapphire nozzles/plugs	GO-H9-C-UNP-PKG

When ordering a standard Gopher package, the Dealer should specify:

1. Package Part ID
2. Pump pressure and flow
3. Hose length and ID
4. Jetting configuration with nozzle/plug locations
5. Hose/lance adapter, if required

FOR EXAMPLE:

QTY	PART ID	DESCRIPTION
1	GO-MP9-POL-PKG	Pump 15 gpm 15,000 psi 1/2 in. ID hose 75 ft long
1	AF 065-MP9-P8	Adapter for 1/2 NPT

ORDERING BY LINE ITEM

Complete tools can be configured by following the steps outlined on the following pages.
Contact your StoneAge Account Representative for questions about specific applications.

STEP 1 \ SWIVEL SELECTION

There are two Gopher swivel options available. Select the correct swivel based on the maximum working pressure required for the application.

MAXIMUM PRESSURE	INLET CONNECTION	SWIVEL PART ID
22k psi 1500 bar	9/16 MP	GO-MP9
40k psi 2800 bar	9/16 HP	GO-H9-C

STEP 2 \ HOSE/LANCE CONNECTION

A hose/lance connector may be required. A Gopher swivel is typically connected to a hose or lance with either a collar and gland nut or a hose adapter. See *Fittings and Adapters* for available options.
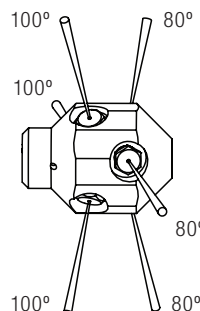
STEP 3 \ HEAD SELECTION

There are two standard head configurations for Gopher tools. Custom heads are available on request.
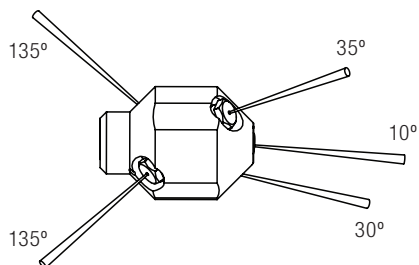
UNPLUGGER
5 Ports:
1 @ 10º
1 @ 30º
1 @ 35º
2 @ 135º

POLISHER
6 Ports:
3 @ 80º
3 @ 100º

The correct head specification is based on the swivel, pressure, and flow of the pump.

SWIVEL	PRESSURE	FLOW		UNPLUGGER HEAD	POLISHER HEAD
GO-MP9	15k psi 1000 bar	9–18 gpm	34–68 l/min	GO 043-R.17	GO 042-R.14
		18–25 gpm	68–95 l/min	GO 043-R.08	GO 042-R.07
	22k psi 1500 bar	10–15 gpm	38–57 l/min	GO 043-R.17	GO 042-R.14
		15–25 gpm	57–95 l/min	GO 043-R.08	GO 042-R.07
GO-H9-C	30k psi 2100 bar	4–8 gpm	15–30 l/min	GO 343-R.18	GO 342-R.14
		8–12 gpm	30–45 l/min	GO 343-R.08	GO 342-R.08
	40k psi 2800 bar	4–8 gpm	15–30 l/min	GO 343-R.18	GO 342-R.14
		8–12 gpm	30–45 l/min	GO 343-R.08	GO 342-R.08

PLEASE NOTE: Pressures and flows in the above table are only approximations of common jetting scenarios.

For most accurate head selection, use the StoneAge Jetting App:
JETTING.STONEAGETOOLS.COM

GOPHER TOOL CONFIGURATION

STEP 4 \ NOZZLES AND PLUGS

Gopher tool heads can be jetted in different configurations depending on the application. Here are the nozzle/plug configurations that are suitable for the Gopher tools:

HEAD STYLE	10º PORT	30º PORT	35º PORT	135º PORTS
Unplugger	1 x Nozzle	1 x Nozzle	1 x Nozzle	2 x Nozzle
	1 x Nozzle	1 x Plug	1 x Plug	2 x Nozzle
	1 x Plug	1 x Nozzle	1 x Nozzle	2 x Nozzle
	1 x Plug	1 x Plug	1 x Plug	2 x Nozzle

HEAD STYLE	80º PORTS	100º PORTS
Polisher	3 x Nozzle	3 x Nozzle
	3 x Plug	3 x Nozzle

Once you have confirmed the jetting configuration, use the StoneAge Jetting App to determine nozzle sizes:
JETTING.STONEAGETOOLS.COM

See *Nozzles and Extensions* for information on StoneAge Sapphire nozzles.

STEP 5 \ CENTRALIZER OPTIONS

A centralizer helps to protect the tool as it passes through the pipe and balances jet standoff distance for more consistent cleaning. In cases where pipe size is more than 1.5 times the diameter of the tool, a centralizer is an important safety device, preventing the tool from turning around and thrusting backwards out of the pipe.

Two types of centralizers are available for Gopher tools:

CENTRALIZER WITH SKIDS AND COLLARS

| PIPE SIZE	CENTRALIZER (COMPLETE)	WEIGHT	COLLAR*	SKID**
4 in. 100 mm	GO 070-4	1.4 lb 0.6 kg	GO 070.1	RJ 070.2-4
5 in. 127 mm	GO 070-5	1.6 lb 0.7 kg	GO 070.1	RJ 070.2-5
6 in. 152 mm	GO 070-6	1.9 lb 0.9 kg	GO 070.1	RJ 070.2-6
8 in. 203 mm	GO 070-8	2.2 lb 1.0 kg	GO 070.1	RJ 070.2-8
12 in. 305 mm	GO 070-12	4.0 lb 1.8 kg	GO 070.1	RJ 070.2-12

*Set of 2 collars   **Set of 3 skids with 6 screws
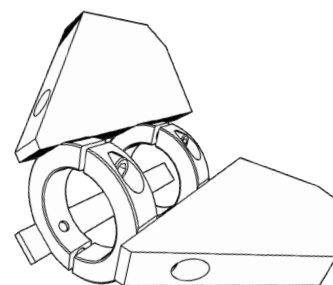
PLASTIC CENTRALIZER WITH SET SCREWS

PIPE SIZE	CENTRALIZER (COMPLETE)	WEIGHT
3 in. 76 mm	GO 075-3	0.3 lb 0.1 kg
4.5 in. 114 mm	GO 075-4.5	0.4 lb 0.2 kg

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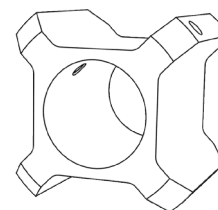
STEP 8 \ BACKOUT PREVENTER

Backout preventers increase operator safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters, and adapters for pipes with no-flange entry.

| PIPE SIZE	HOSE OD	BACKOUT PREVENTER	DESCRIPTION	WEIGHT
2–6 in. 51–150 mm	0.3–0.7 in. 8–18 mm	BJ 305*	Backout preventer for small pipes	5.6 lb 2.5 kg
4–8 in. 100–200 mm	0.3–1.5 in. 8–38 mm	BJ 310	Backout preventer for small to medium pipes	7.6 lb 3.4 kg
5–17 in. 130–430 mm	0.3–1.5 in. 8–38 mm	BJ 320	Backout preventer for medium to large pipes	6.3 lb 2.9 kg
15–36 in. 380–910 mm	N/A	BJ 325	Extension kit for BJ 320 backout preventer	8.5 lb 3.6 kg
8–36 in. 130–910 mm	N/A	BJ 340	No-flange kit for BJ 320 backout preventer	17 lb 7.7 kg

*Securing device not supplied

BJ 305

BJ 310

BJ 320

BJ 320 shown with BJ 325 extension kit and BJ 340 No-flange attachment kit
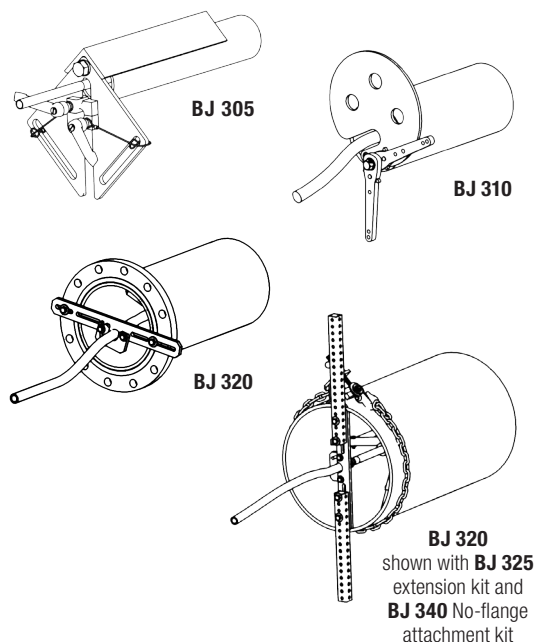
STEP 7 \ ACCESSORIES

A Pelican™ brand protection/carrying case with custom cut foam insert is available for Gopher tool models.

EXTERIOR DIMENSIONS (L X W X D)	INTERIOR DIMENSIONS (L X W X D)	COLOR	CASE PART ID
11.6 x 8.3 x 3.8 in. 29.6 x 21.2 x 9.6 cm	10.5 x 6.0 x 3.2 in. 26.8 x 15.3 x 8.0 cm	Black	BC 080
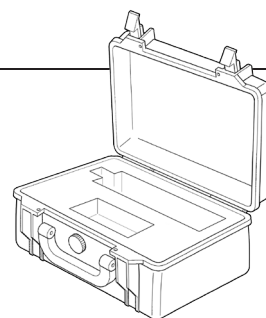
STEP 8 \ MAINTENANCE RESOURCES

SWIVEL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	TOOL KIT	LUBRICANT	MANUAL
GO-MP9	GO 600	GO 602	GO 610	GO 612	GP 044	PL 511
GO-H9-C	GO 600-H9-C	BC 602-H9-C	GO 610-H9-C	GO 612	GP 044	PL 510

Kit components and tool maintenance/assembly videos are available on the StoneAge Dealer Portal:
DEALER.STONEAGETOOLS.COM

For questions or help with a specific application, configuration or tool repairs, please contact your StoneAge Account Representative.

GOPHER TOOL CONFIGURATION

When ordering a Gopher tool by line item, the Dealer should specify:

1. Swivel Part ID
2. Head Part ID
3. Nozzle/plug Part IDs
4. Part ID of hose/lance adapter, if required
5. Part IDs of any accessories or maintenance items

FOR EXAMPLE:
Gopher tool with Polisher head, plugs for 80° ports, nozzles for 100° ports. 15,000, psi 15 gpm. 100 ft 1/2 in. ID hose with 1/2 NPT Male end. Centralizer for 8 in. pipes and a Service Kit.

QTY	PART ID	DESCRIPTION
1	GO-MP9	Gopher Swivel Assy, 22k psi
1	GO 042-R.14	Polisher head, 22k psi 1/8 NPT ports
3	GP 025-P2SS	Hex socket plug, 1/8 NPT, SS
3	AP2 038	Attack Tip 1/8 NPT
1	AF 065-MP9P8	Adapter 9/16 MP Male 1/2 NPT Female 15k psi
1	GO 070-8	Centralizer assembly
1	GO 600	Service Kit for GO-MP9 swivel

TOOL COMPONENT VIEW

GO-MP9

BC 230
Sleeve

BC 225
Garter Spring (2)

BC 220
Weights

BC 315
Spring

GO 001
Shaft

BC 031
Backup Ring

BC 040
O-Ring

groove in the Inlet Nut.

RJ 007
Bearing

RJ 029
Shaft Seal

GO 003
Body

FT 026
Port Screw

BJ 072
O-Ring

GO 022
Inlet Seat

GO 123
O-Ring

GO 020
Seal Holder

RJ 012-KTO
H.P. Seal

RJ 011-KC
Carbide Seat

GO 002
Inlet Nut

RJ 008
O-Ring

MT 010
Shaft Seal

BC 009
Bearing

BC 222
Washer

GO 025
Collar

GO-H9-C

MT 010
Shaft Seal

RJ 008
O-Ring

BC 505-S
Cartridge Assy

GO 402
Inlet Nut

GO 025
Collar

BJ 417
O-Ring

FT 026
Port Screw

RJ 029
Shaft Seal

GO 303
Body

BC 040
O-Ring

BC 009
Bearing

RJ 029
Shaft Seal

BC 031
Backup Ring

GO 401
Shaft

RJ 007
Bearing (2)

BC 222
Washer

BC 220
Weights

BC 315
Spring

BC 230
Sleeve