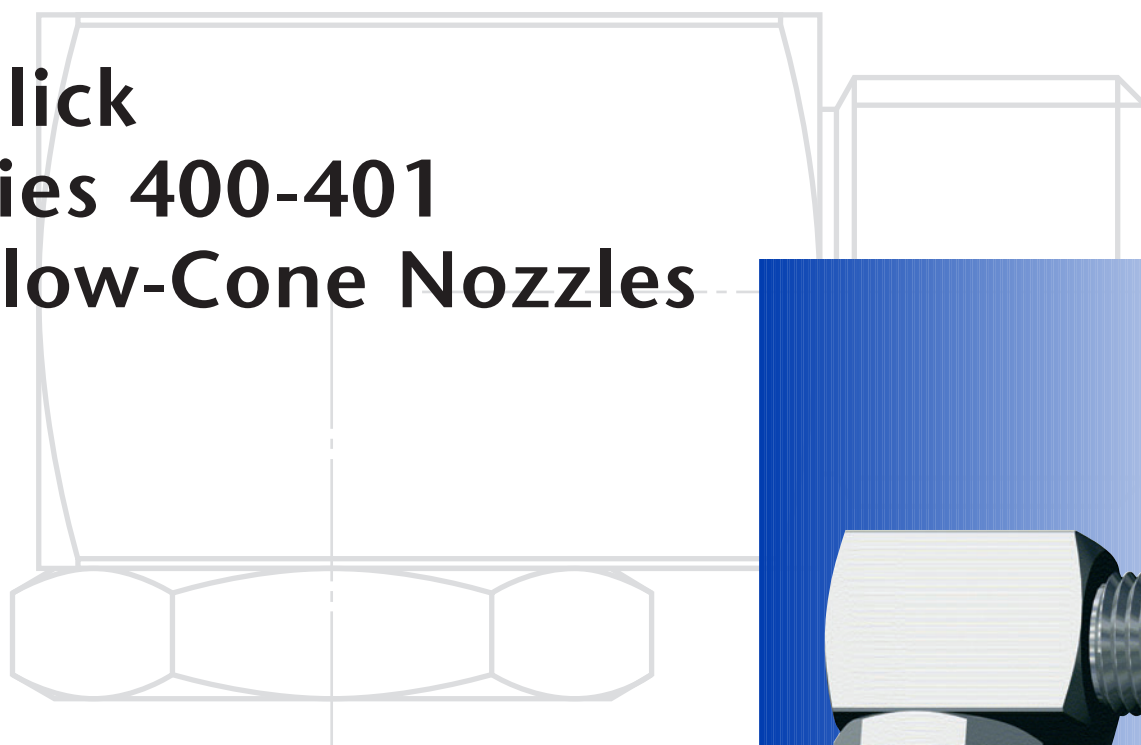


# Schlick Series 400-401 Hollow-Cone Nozzles

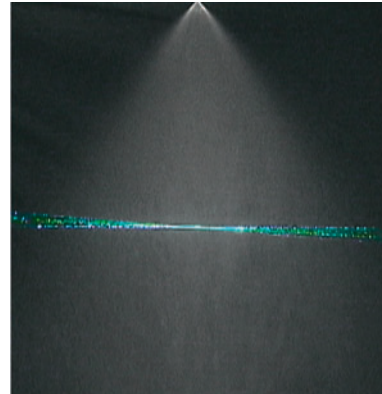


## **Applications:**

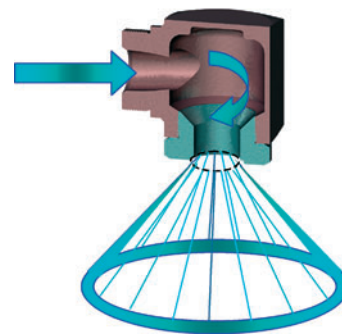
- Air conditioning
- Atomising impure liquids
- Direct lubrication
- Dust control
- Foam sprinkling
- Gas cooling
- Gas scrubbing
- Grease atomising
- Humidifying
- Mixing
- Process engineering
- Pulp moisturising
- Spray drying
- Sprinklers

## Schlick hollow-cone nozzles

- Hollow-cone nozzles atomise liquids under pressure into finest droplets having a large specific surface.
- Our Model 400 and 401 nozzles are especially designed for right-angled installation.
- They are of two parts and comprise the nozzle body and an exchangeable orifice insert.
- Because there are no extra parts such as a twist body, these nozzles are not subject to clogging.
- However, they are less suited to higher viscosity media.



- The liquid is fed to the nozzle under pressure, enters the swirl chamber tangentially, and is forced into rotation. In the swirl chamber the energy in the pressurised liquid is converted into rotational energy.
- A centrifugal film of rotating liquid forms a hollow cone.
- After overcoming surface tension, the cone disperses into a myriad of fine droplets.
- This process results in a uniform, with small orifices very fine atomisation of the liquid in the form of a hollow cone.
- The nozzles are available with 1 mm to 45 mm diameter orifices.



- The nozzle diameter is stamped on the individual nozzles in  $\frac{1}{10}$  mm.
- For technical reasons, nozzles with a spray cone that differs from the standard cone must be fitted with a smaller or larger orifice insert. The flow rate in each case, however, corresponds to the standard orifice.

**Example: Model 401 Size 4, G1/2" IG, 7.0 mm orifice**  
 Standard spray angle effective orifice = approx. 7.0 mm  
 45° spray angle effective orifice = approx. 5.7 mm  
 90° spray angle effective orifice = approx. 8.6 mm  
 The flow rates and identification correspond, however, to a 7.0 mm orifice.

## Materials

- |                                  |             |            |   |
|----------------------------------|-------------|------------|---|
| - Brass                          | - Tantalum  | - PVDF     | Custom products from other materials available on request |
| - Acid resistant stainless steel | - HASTELLOY | - PVC      |   |
| - Heat resistant stainless steel | - INCONEL   | - PTFE     |   |
| - Titanium                       | - PP        | - RCH 1000 |   |

## Nozzle designs

### Model 400 – Hollow-cone nozzle

With female thread



Fig. 06001

### Model 401 – Hollow-cone nozzle

With male thread

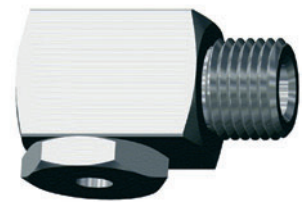


Fig. 06002

### Model 401 – Hollow-cone nozzle

With male thread

Plastic body

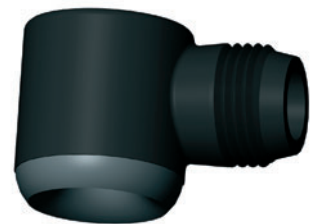


Fig. 06003

## Dimensions

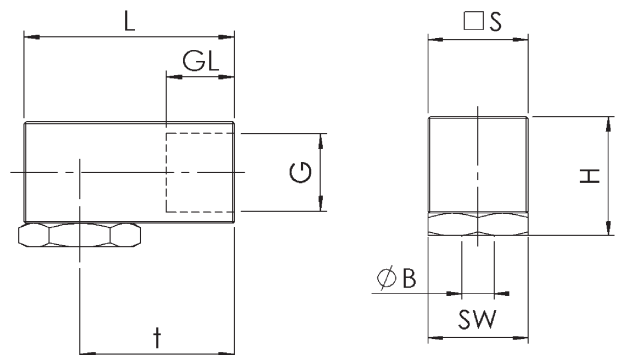
### Model 400 – Hollow-cone nozzle

All materials

Size	B	S	L	G	GL	H	t	SW
1	- 2.8	14	28	1/8	10	18.0	20	14
2	- 4.8	17	34	1/4	11	21.0	25	17
3	5.0 - 6.0	22	40	3/8	13	27.5	29	20
4	7.0 - 8.0	25	45	1/2	16	30.0	32	24
5	9.0 -10.0	35	57	3/4	18	42.5	40	32

Plastics (PVC – PP – RCH 1000, etc.)

Size	B	S	L	G	GL	H	t	SW
1	- 2.8	14	28	1/8	8	18.0	20	14
2	- 4.8	17	34	1/4	9	21.0	25	17
3	5.0 - 6.0	22	40	3/8	11	27.5	29	20
4	7.0 - 8.0	25	45	1/2	14	30.0	32	24
5	9.0 -10.0	35	57	3/4	16	42.5	40	32



## Dimensions

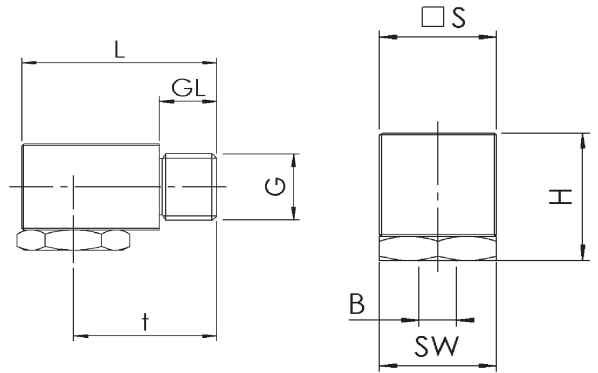
### Model 401 – Hollow-cone nozzle

All materials

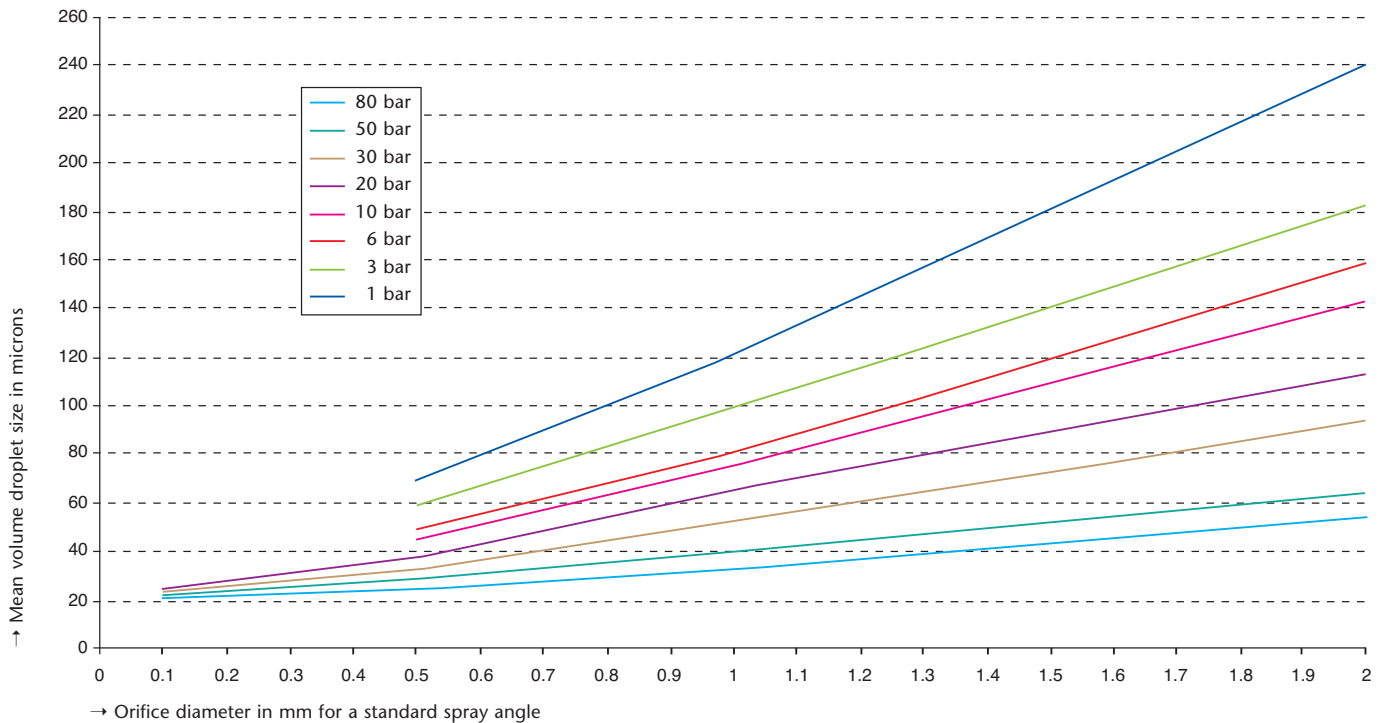
Size	B	S	L	G	GL	H	t	SW
1	- 2.8	14	28	1/8	8	18.0	20	14
2	- 4.8	17	34	1/4	9	21.0	25	17
3	5.0 - 6.0	22	40	3/8	11	27.5	29	20
4	7.0 - 8.0	25	45	1/2	14	30.0	32	24
5	9.0 -10.0	35	57	3/4	16	42.5	40	32

Plastics (PVC – PP – RCH 1000, etc.)

Size	B	S	L	G	GL	H	t	SW
6	13 - 15	60	85	1/8	20	68	55	46
7	18 - 21	70	100	1/4	22	82	65	60
8	23 - 25	80	115	3/8	24	92	75	60
9	30 - 36	100	140	1/2	28	115	90	80
10	40 - 45	120	170	3/4	30	140	100	90



## Droplet size



## Performance specification

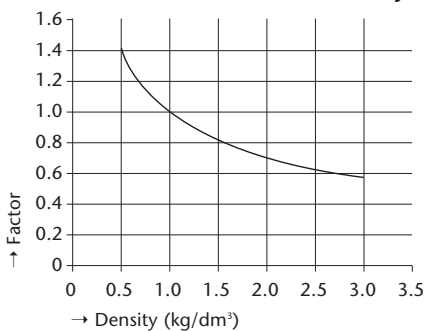
Flow referred to water at 16 °C.

Flow rates for liquids of densities deviating from that of water change correspondingly.

Δp 3 bar was chosen for as the rated pressure and for testing as this pressure is usually available in most water mains.

Model 400/401 Size	Connector thread G DIN 259	Nozzle orifice Ø in mm	Δp 0.5 bar l/min	Δp 1 bar l/min	Δp 2 bar l/min	Test pressure Δp 3 bar l/min	Δp 4 bar l/min	Δp 6 bar l/min	Δp 8 bar l/min	Δp 10 bar l/min	Standard spray angle at 3 bar
1	1/8	1.1		0.27	0.38	0.47	0.54	0.66	0.77	0.86	65°
		1.6	0.41	0.58	0.81	1.00	1.16	1.43	1.64	1.83	70°
		2.3	0.84	1.19	1.68	2.06	2.38	2.92	3.37	3.76	75°
		2.8	1.24	1.76	2.48	3.05	3.52	4.32	4.98	5.57	80°
2	1/4	1.6	0.41	0.58	0.81	1.00	1.16	1.43	1.64	1.83	75°
		2.3	0.84	1.19	1.68	2.06	2.38	2.92	3.37	3.76	75°
		2.8	1.24	1.76	2.48	3.05	3.52	4.32	4.98	5.57	75°
		3.2	1.63	2.30	3.26	4.00	4.62	5.65	6.52	7.30	78°
		3.6	2.06	2.92	4.12	5.05	5.83	7.15	8.25	9.20	78°
		3.9	2.41	3.40	4.80	5.90	6.82	8.35	9.63	10.75	78°
3	3/8	4.2	2.82	3.98	5.63	6.90	7.95	9.75	11.30	12.60	80°
		4.5	3.23	4.55	6.45	7.90	9.10	11.20	12.90	14.40	80°
		4.8	3.68	5.20	7.35	9.00	10.40	12.75	14.70	16.50	80°
		5.0	4.00	5.60	7.95	9.75	11.13	13.80	15.90	17.80	82°
4	1/2	5.5	4.82	6.80	9.65	11.80	13.60	16.70	19.25	21.50	82°
		6.0	5.70	8.10	11.40	14.00	16.20	19.80	22.80	25.60	82°
		7.0	7.80	11.00	15.60	19.10	22.00	27.00	31.20	34.80	82°
5	3/4	8.0	10.20	14.40	20.40	25.00	28.80	35.40	40.80	45.70	82°
		10.0	15.90	22.50	31.80	39.00	45.00	55.20	63.70	71.20	82°
6	1	11.0	19.20	27.20	38.40	47.00	54.50	66.50	77.00	86.00	82°
		13.0	27.00	38.00	54.00	66.00	76.00	93.00	108.00	120.00	85°
7	1 1/4	15.0	36.00	51.00	72.00	88.00	102.00	124.00	144.00	161.00	85°
		18.0	51.00	73.00	103.00	126.00	145.00	178.00	206.00	230.00	85°
8	1 1/2	21.0	70.00	99.00	140.00	172.00	197.00	244.00	281.00	314.00	85°
		23.0	84.00	119.00	168.00	206.00	238.00	292.00	337.00	376.00	85°
9	2	25.0	100.00	140.00	198.00	243.00	280.00	344.00	397.00	445.00	85°
		30.0	143.00	203.00	287.00	352.00	406.00	497.00	575.00	642.00	85°
10	2 1/2	36.0	206.00	292.00	412.00	505.00	583.00	650.00	715.00	825.00	85°
		40.0	255.00	360.00	510.00	625.00	721.00	884.00	1020.00	1141.00	85°
		45.0	323.00	456.00	645.00	790.00	912.00	1117.00	1290.00	1442.00	85°

Conversion factor for density



- Flow rates change for liquids of densities deviating from that of water.
- Use the conversion factors on the left to determine flow rates.
- To convert the flow rate, multiply the value referring to water from the table above by the respective conversion factor.
- The influence of viscosity cannot be calculated. The flow rate must be determined experimentally for values differing largely from water.

## Service spectrum

### Pilot test laboratory

Before any new spray nozzles are used we subject them to comprehensive trials in our own test laboratory – if need be to your operational parameters. During these tests, we precisely determine droplet size, velocities and flow densities with our modern DUAL PDA laser-measuring equipment.



### Test nozzles

Schlick spray nozzles are world renowned for highest precision. We can offer you the best and most lasting solution to your requirements. And, if you want, we can supply you with test nozzles in advance – just contact us.

### Engineering

Take advantage of our comprehensive expertise – from design to installation – the conception of new products or

the optimisation of existing plant. We would be glad to help you improve the success of your operation.

### Repair service

As well as competent advice and its inception, you can profit from an efficient after-sales service that guarantees long-term supply of all products. We carry out both repair and conversion of Schlick spray nozzles, and in emergency, we can supply spare parts quickly and reliably.

### Onsite service

If required we will investigate and develop an optimal solution to suit individual requirements onsite. We will advise you and give you support during installation and initial start-up of the plant. A further plus is the help available from our worldwide technical field service network.

### Custom products

As one of the leading spray nozzle manufacturers in Europe, we can offer both high quality standard solutions and are in the position of developing customised products for individual tasks as fast as possible, even for small production runs.



### Documentation to the customer's requirements

Reliability and quality are the basis for successful cooperation with our international customers. This applies both to our products and to our service. If you wish, we will supply you with all necessary documentation such as technical handbooks for the nozzles (drawings, flow diagrams, installation and operating instructions) together with factory and material specifications.



All specifications are subject to change (flow rates/dimensions).

The performance/flow rate specifications quoted are descriptive or product identities and can vary by up to  $\pm 5$  percent on delivery.



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