

# Thermal Management

Liquid Cooling Solutions for Electronics, Data Centers, Servers and Super Computers

November 2019



ENGINEERING YOUR SUCCESS.

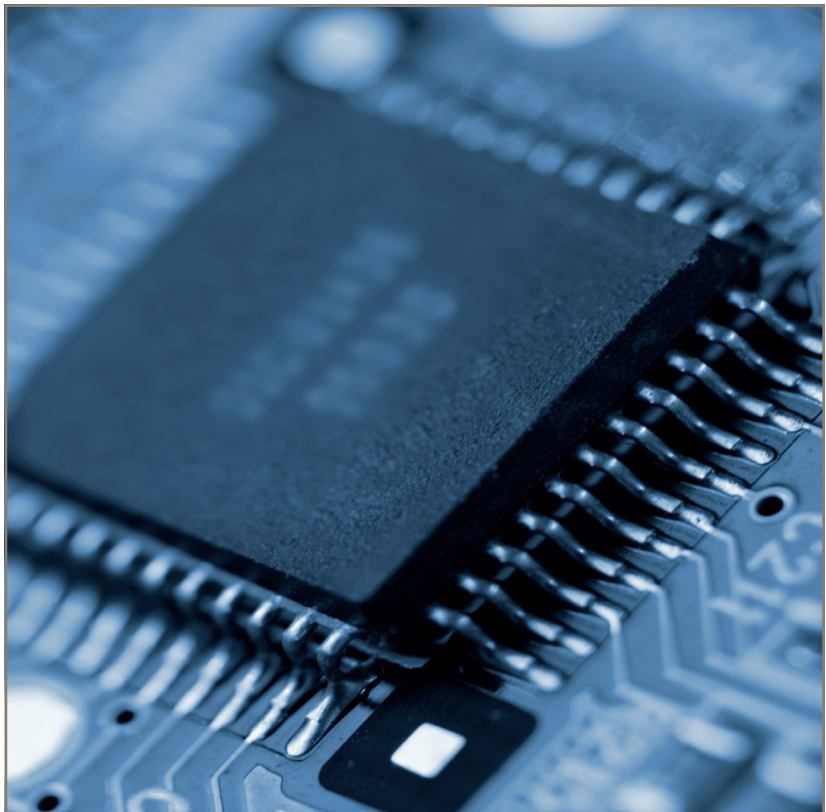
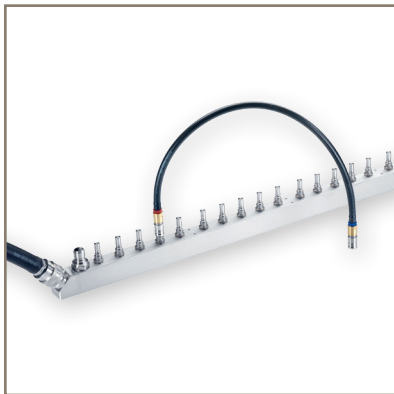
# We Developed a Cool Solution!

Quick connect coupling system – efficient components in the area of thermal management

The requirements for quick connect couplings for tempering and thermal management are extremely high.

Our systems stand out for their high level of compatibility with the broadest range of liquids and the application environment.

Likewise, their resistance to mechanical stresses is vital. One of the most important requirements in the cooling of electronic systems is the avoidance of any fluid loss, as this is the only way to guarantee fault-free function of the installation.



▲ Manifolds as a customized solution.

▲ Flat-sealing valve design prevents spillage.



# 60 Years of Know-How

From standard product to customized solution – we meet your requirements

Energy efficiency and compact design play a major role in thermal management applications. As a result of the low pressure drop of our coupling systems, we take energy saving into account at the same time as optimal performance. Reducing the sizes of our couplings allows their use in the most confined spaces.

The flat-sealing valve design reliably prevents any fluid loss during the coupling and uncoupling process, thereby protecting the sensitive electronics and all electrical connections.

You can be sure that the know how we have acquired from

over 60 years in the development and production of quick connect couplings guarantees a reliable and efficient solution for your requirement.



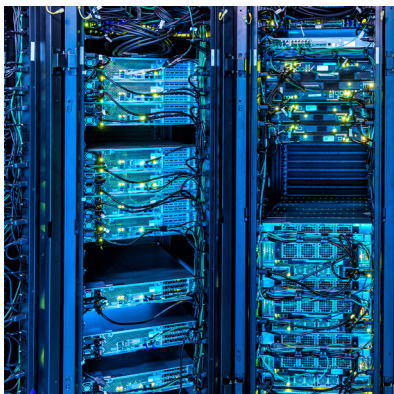
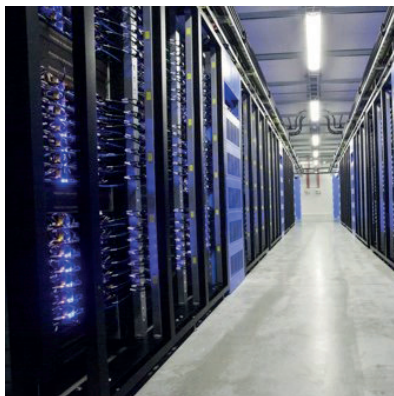
# The Right Solution for Servers and Data Center Cooling

## Information Technologies

Processors (microprocessors) generate waste heat during operation. This results in overheating of the unit, which can cause malfunction even to the point of destruction of components.

A cooling system is, then, mandatory to guarantee the rapid dissipation of the waste heat. Small dissipation areas and high temperatures demand optimized and highly efficient solutions.

As water is 10 times more efficient than air, we provide support to our customers to build complete systems for water cooling for High Performance Computers, Data centers, microelectronics and telecommunication applications.





# Maximum Precision and Reliability

The product advantages at a glance:

Compact design for installation in applications where little space is available.

Low pressure drop for maximum energy efficiency.

Various sizes (3, 6, 9, 12, 16, 19 and 25 mm) for optimal adjustment to the liquid circuits.

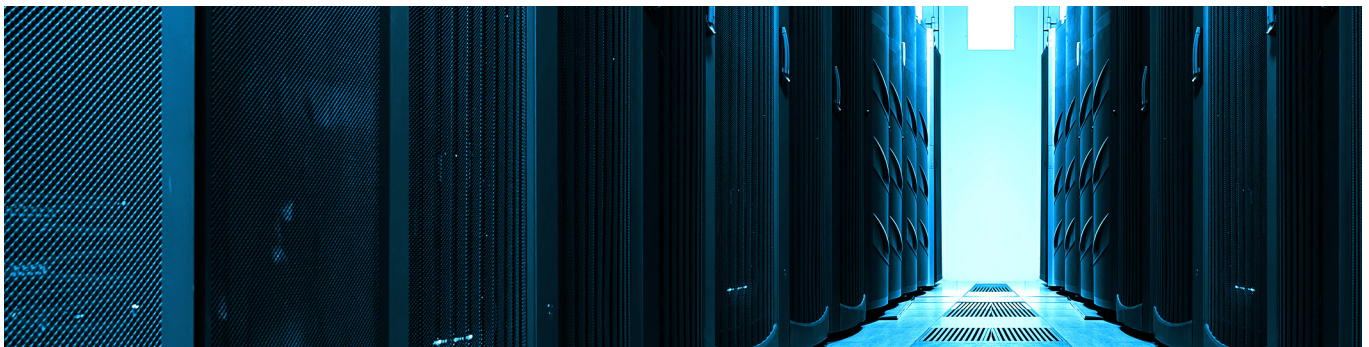
Maximum safety for operator and environment when coupling and uncoupling, due to the FlatFace design – giving optimum protection of the electronics and electrical connections.

Materials in nickel-plated brass or stainless steel for extreme durability in use with the broadest range of liquids (no corrosion).

Broad selection of sealing materials for optimal co-ordination with temperature and fluids.

High resistance to vibrations and rotation.

No leakage when disconnected due to the advanced internal design – even after a long time and pressurisation.



# Thermal Management Range at a Glance

Find the ideal product for your application



	NSG-Series	NSI-Series	UQD-Series
<b>Valves Dry Break</b>			
<b>Working Pressure</b>	11 bar	60 bar	11 bar
<b>Nominal Diameter (mm)</b>	3	3/6/9/12	3.2/6.3
<b>Technical Description</b>	<ul style="list-style-type: none"> <li>• Two-hand operation</li> <li>• Push to connect version available on request</li> </ul>	<ul style="list-style-type: none"> <li>• Two-hand operation</li> <li>• Push to connect version available on request</li> </ul>	<ul style="list-style-type: none"> <li>• Fully interchangeable with other Intel-approved UQD suppliers</li> </ul>
<b>Material (Coupling Body)</b>	Stainless Steel	Brass/Stainless Steel	Stainless Steel
<b>Seals</b> (other seal variants on request)	EPDM	FKM/EPDM	EPDM
<b>Working Temperature</b>	-40°C up to 70°C	-50°C up to +200°C (FKM)	-40°C up to 70°C





NSE-Series	NSA-Series	Customized Solution
		Blindmate connection
15 bar	20 bar	up to 15 bar
16/19/25	10/12	
<ul style="list-style-type: none"> <li>Two-hand operation</li> <li>Push to connect version available on request</li> </ul>	Extreme lightweight (Aluminium)	Parker offers manifolds using RNS or Cartridge couplings
Stainless Steel	Anodized Aluminium	on request
FKM/EPDM	FKM/EPDM	on request
-20°C up to +200°C (FKM)	-20°C up to +200°C (FKM)	following seals material requested



## Dry-Break

### Max. Working Pressure

11 bar

### Material

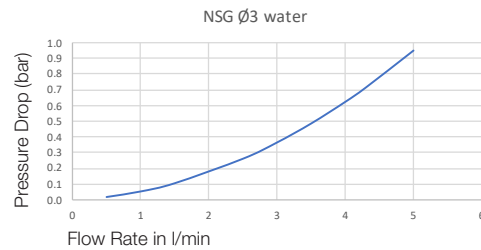
**Coupling:** Stainless Steel  
**Plug:** Stainless Steel  
**Seals:** EPDM

### Applications

- Computers and telecommunications
- Electronic Cabinets

### Flow diagrams

#### Water



### Technical Description

The NSG are dry-break couplings with flat face valves. The compact design makes them suitable for reduced spaces. Coupling system with two-hand operation, i.e. both hands are required when connect/disconnect.

### Working Temperature

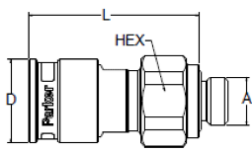
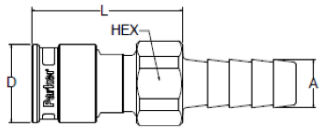
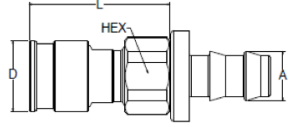
-40 C - 70 C (Extended temperature range is possible, contact factory for more information.)

### Advantages

- No spillage during connection/disconnection
- Low pressure drop
- Advanced internal design for cooling applications
- Can be used either with water or heat transfer oils
- Excellent resistance to vibrations and mechanical stresses





	DN	Connection A	HEX mm	L mm	D mm	Part Number
 <p>Male Thread</p>		G 1/8	17.5	34.8	17.0	NSG-121-2MB
 <p>Female Thread</p>		3/8" Hose Barb	17.5	33.3	17.0	NSG-121-6HB
 <p>Parker Push-Lok</p>		3/8" Pushlok	17.5	34.0	17.0	NSG-121-6PL



## Dry-Break

### Max. Working Pressure\*

60 bar

\* maximum static working pressure with design factor 4 to 1.

### Material

**Coupling:** Brass/Stainless Steel

**Plug:** Brass/Stainless Steel

**Seals:** FKM

Other materials available on request.

### Applications

- Molding
- Electronic cabinets
- Laser

- Converters
- Radar, etc.
- Computers and telecommunications

### Flow diagrams

### Technical Description

The NSI are dry-break couplings with flat face valves. The compact design make them suitable for reduced spaces. Coupling system with two-hand operation, i.e. both hands are required when connect/disconnect.

Push to connect version available on request: NSP series

### Working Temperature

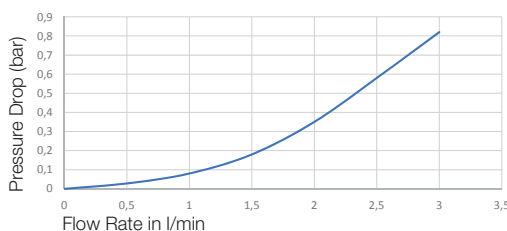
-20°C up to +200°C (FKM) depending on the medium. Other seals materials are available on request.

### Advantages

- No spillage during connection/disconnection.
- Low pressure drop.
- Advanced internal design for cooling applications.
- Can be used either with water and heat transfer oils.
- Excellent resistance to vibrations and mechanical stresses.

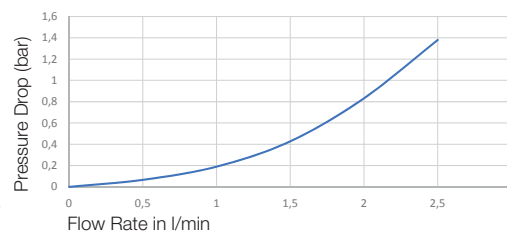
#### Water

NSI Ø3 water



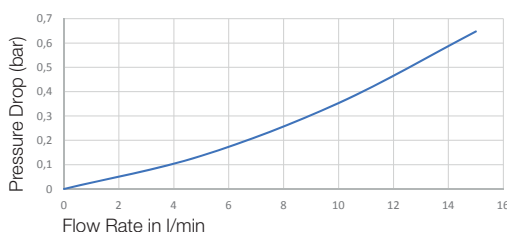
#### Oil

NSI Ø3 oil (32 cSt)



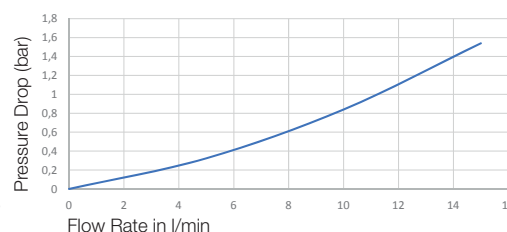
#### Water

NSI Ø6 water



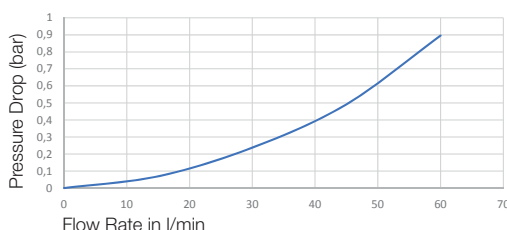
#### Oil

NSI Ø6 oil (32 cSt)



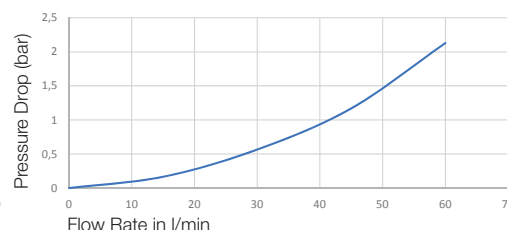
#### Water

NSI Ø9 (water)



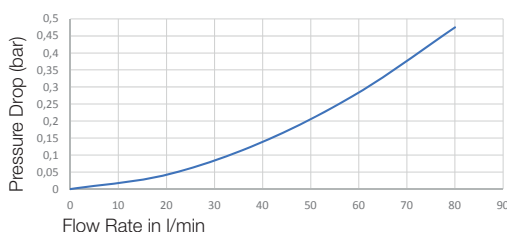
#### Oil

NSI Ø9 oil (32 cSt)



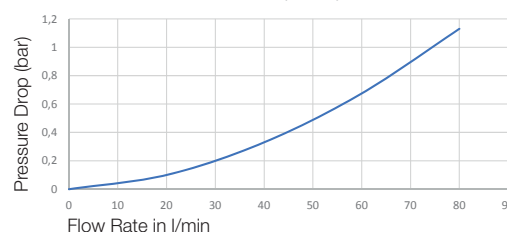
#### Water

NSI Ø12 water



#### Oil

NSI Ø12 oil (32 cSt)

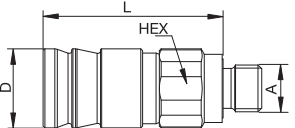
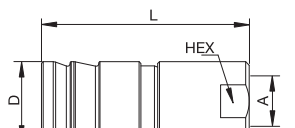
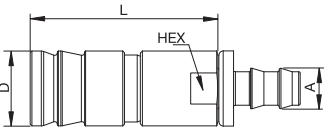






## Couplings

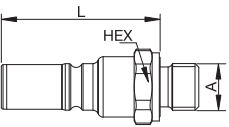
## Series NSI

	DN	Connection A	HEX mm	L mm	D mm	Part Number
 Male Thread	3	G 1/8	14	38	17	NSI-121-2MBE <sup>1</sup>
	6	M 16 x 1,5	20	44,8	22	NSI-251-16MCL-2 <sup>2</sup>
	9	G 3/8	27	63	30	NSI-371-6MBO
	12	G 1/2	35	90,4	42	NSI-501-8MBO
 Female Thread	6	G 1/4	20	57,9	22	NSI-251-4FB
	9	G 3/8	27	72	30	NSI-371-6FB
	12	G 1/2	35	99,4	42	NSI-501-8FB
 Parker Push-Lok	6	10 mm	20	55,2	22	NSI-251-6PL



## Plugs

## Series NSI

	DN	Connection A	HEX mm	L mm	D mm	Part Number
 Male Thread	3	G 1/8	14	36,5		NSI-122-2MBE <sup>1</sup>
	6	G 1/4	19	44		NSI-252-4MBE <sup>1</sup>
	9	G 3/8	24	60,2		NSI-372-6MBO
	12	G 1/2	32	79,1		NSI-502-8MBO

<sup>1</sup> End connection according to ISO1179-2 ED seal

<sup>2</sup> End connection according to DIN 2353 24° cone



## Max. Working Pressure

11 bar

## Material

**Coupling:** Stainless Steel

**Plug:** Stainless Steel

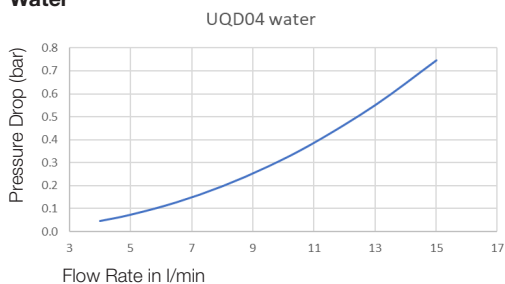
**Seals:** EPDM

## Applications

- Computers and telecommunications
- Electronic Cabinets

## Flow diagrams

### Water



## Technical Description

Universal Quick Disconnect (UQD) based on an Intel inspired open specification. Developed in collaboration with Intel Corporation.

## Working Temperature

40° C - 70° C (Extended temperature range is possible, contact factory for more information.)

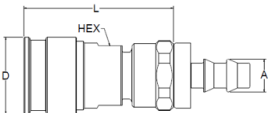

## Advantages

- Fully interchangeable with other Intel-approved UQD suppliers



## Couplings

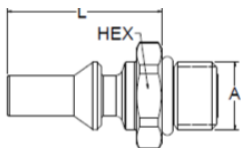
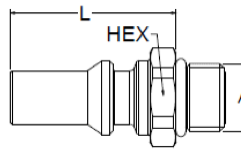
## Series UQD

	DN	Connection A	HEX mm	L mm	D mm	Part Number
 <p>Parker Push-Lok</p>		1/4" Pushlok	16	40.3	20.45	UQD-121-4PL
 <p>Parker Push-Lok</p>		3/8" Pushlok	24	47.6	23.4	UQD-251-6PL



## Plugs

## Series UQD

	DN	Connection A	HEX mm	L mm	D mm	Part Number
		7/16-20 UNF -4ORB	16	25.5		UQD-122-4MO
		9/16 18 UNF	19	34.7		UQD-252-6MO





## Technical Description

The NSE are dry-break couplings with flat face valves. The compact design makes it suitable for reduced spaces when high flow is needed. Coupling system with two-hand operation, i.e. both hands are required when connect/disconnect.

## Working Temperature

-20°C up to +200°C (FKM)  
depending on the medium.

Other seals materials are available on request.

## Advantages

- High flow with low pressure drop.
- No spillage during connection/disconnection.
- Specific design for cooling applications.
- Reduced dimensions compared to flow capacities.



## Max. Working Pressure\*

15 bar

\* maximum static working pressure  
with safety factor 4 to 1.

## Material

**Coupling:** Stainless Steel

**Plug:** Stainless Steel

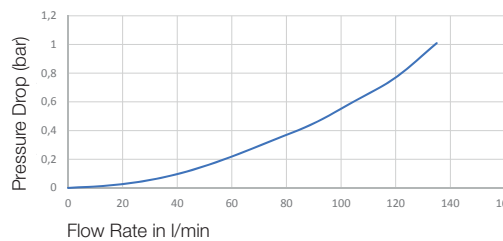
**Seals:** FKM

## Applications

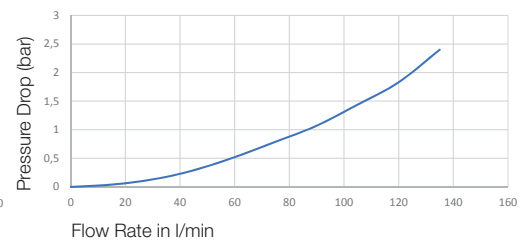
- Molding
- Electronic cabinets
- Laser
- Converters
- Radar, etc.

## Flow diagrams

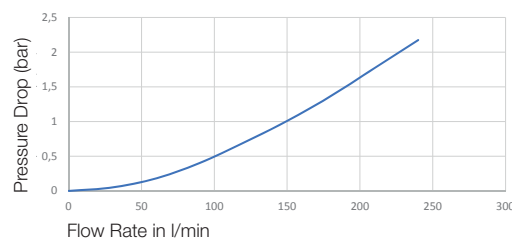
**Water** NSE Ø16 Water



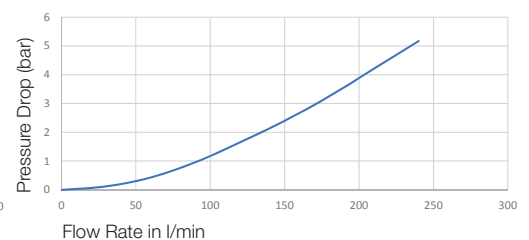
**Oil** NSE Ø16 Oil



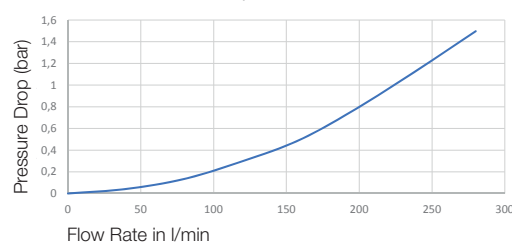
**Water** NSE Ø19 Water



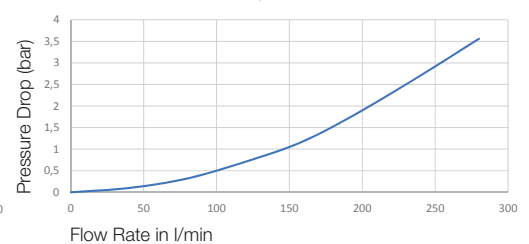
**Oil** NSE Ø19 Oil



**Water** NSE Ø25 Water



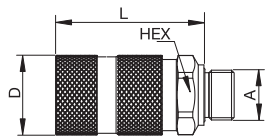
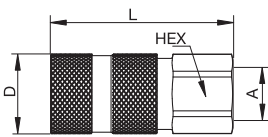
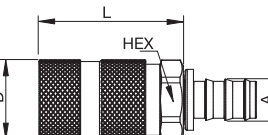
**Oil** NSE Ø25 Oil





## Couplings

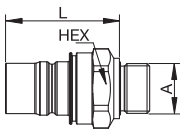
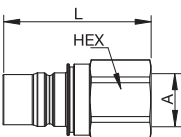
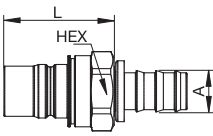
## Series NSE

	DN	Connection A	HEX mm	L mm	D mm	Part Number
 Male Thread	16	G 3/4	34	68,8	37	NSE-621-12MBO
	19	G 3/4	38	78,5	42	NSE-751-12MBO
 Female Thread	19	G 1	38	96,6	42	NSE-751-16FB
	25	G 1 1/4	50	120,5	53	NSE-1001-20FB
 Parker Push-Lok	19	12,5 mm	38	76,4	42	NSE-751-8PL
	19	19 mm	38	76,4	42	NSE-751-12PL



## Plugs

## Series NSE

	DN	Connection A	HEX mm	L mm	D mm	Part Number
 Male Thread	16	G 3/4	34	56,5		NSE-622-12MBO
	19	G 3/4	38	60,3		NSE-752-12MBO
 Female Thread	19	G 1	38	78,4		NSE-752-16FB
	25	G 1 1/4	50	96,8		NSE-1002-20FB
 Parker Push-Lok	19	12 mm	38	58,2		NSE-752-8PL
	19	19 mm	38	58,2		NSE-752-12PL



## Max. Working Pressure

20 bar

## Material

**Coupling:** Anodized Aluminium

**Plug:** Anodized Aluminium

**Seals:** Fluorosilicone

## Applications

- Cooling of onboard electronic equipment, engines and batteries
- Cooling for converters, data centers, military equipment and medical imaging equipment.

## Technical Description

Minimal fluid loss during disconnection. NSA couplings have minimal pressure drop and no inclusion of air or dust during connection.

## Working Temperature

-50°C up to +175°C (Fluorosilicone) depending on the medium.

Other seals materials are available on request.

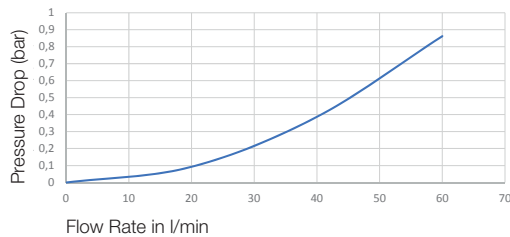
## Advantages

- No spillage during connection/disconnection.
- Light weight due to aluminium construction.
- Push-Lok connection for fast assembly.

## Flow diagrams

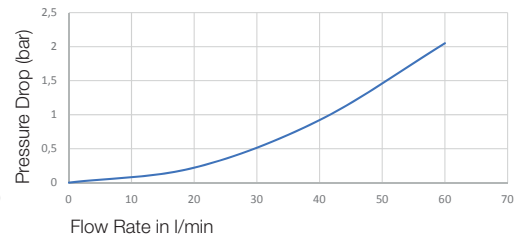
### Water

NSA Ø10 water



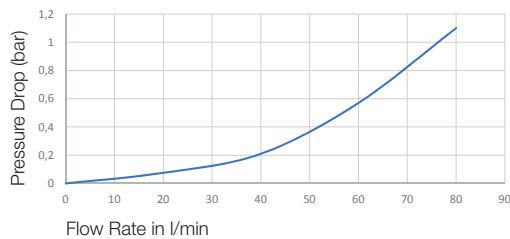
### Oil

NSA Ø10 Oil



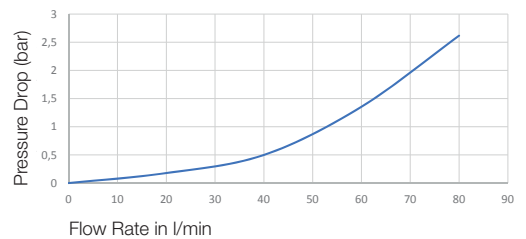
### Water

NSA Ø12 water



### Oil

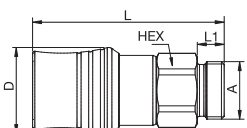
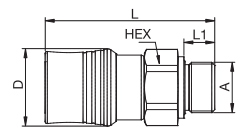
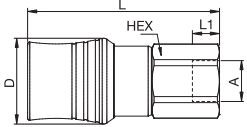
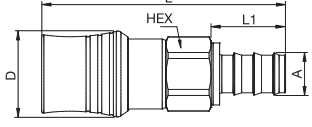
NSA Ø12 Oil





## Couplings

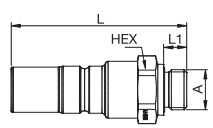
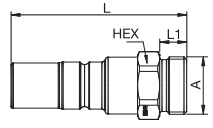
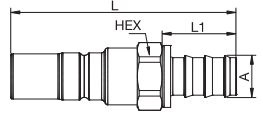
## Series NSA

	DN	Connection A	HEX mm	L mm	L1 mm	D mm	Weight gr.	Part Number
 Male Thread metric DIN 2353	12	M 30 x 1,5	35	99,4	14	44,5	231	NSA-501-30MCL
 Male Thread BSPP	10	G 1/2	35	91,6	14	40	157	NSA391-8MBO
 Female Thread BSPP	12	G 1/2	35	99,4	14	44,5	249	NSA-501-8FB
 Parker Push-Lok	12	19 mm	35	126,40	38,30	44,5	239	NSA-501-12PL



## Plugs

## Series NSA

	DN	Connection A	HEX mm	L mm	L1 mm	D mm	Weight gr.	Part Number
 Male Thread BSPP with O-ring Seal	10	G 1/2	27	81	12		67	NSA-392-8MBO
	12	G 1/2	32	91,1	12		88	NSA-502-8MBO
 Male Thread Metric	12	M 30 x 2	32	91,1	14		93	NSA-502-30MCL
 Parker Push-Lok	12	19 mm	32	117,1	38,3		97	NSA-502-12PL



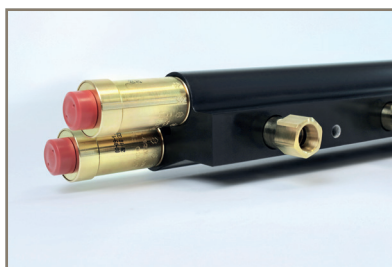
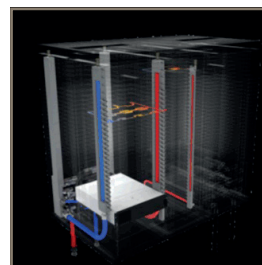
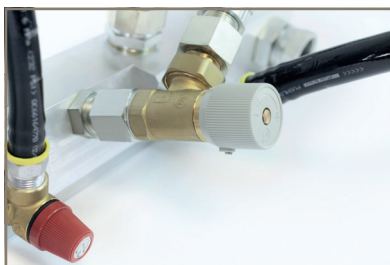
# Customized Systems

We offer engineering support to our customers for the codevelopment of the complete cooling installation. A special care is accorded to the pressure drop for energy saving and to assure the optimal temperature management.

We propose a complete 100% tested solution integrating our products, between the chiller to the component to be cooled.

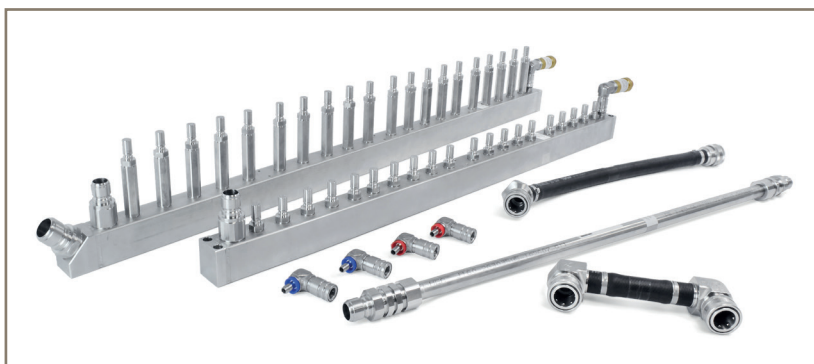
## Our solutions include:

- **Manifolds** – several materials available.
- **Couplings or cartridges** – from 3mm ID to 25 mm ID available in different materials and seals.
- **Hose assemblies** – including Push-lok (hose barb) end connections for an optimal number of components.
- **Bleeding valves, flow regulators, etc.**
- **Pressure and flow sensors.**
- **Others...**



## Advantages

- Push-pull connection/disconnection without touching the couplings
- Advanced internal design for thermal management
- Dry connection/disconnection
- Suitable to blind mate connections due to the floating nipple body (self alignment to the coupling)





#### Technical description

The couplings cartridges are designed to be used on manifolds and sliding racks. They assure a dry connection/disconnection and have an advanced internal design for Thermal management. They are proposed in several materials adapted to the applications.

#### Advantages

- Dry connection/disconnection
- Suitable to blind mate connections due to the floating nipple body (self alignment to the coupling)
- Specific design to assure 100% dry disconnection at any time



#### Technical Description

The RNS are rigid couplings with flat face valves. They can be mounted on rigid manifolds or tubing and assure connection/disconnection without spillage. Base material is brass and stainless steel.

#### Advantages

- Push-Pull connection/disconnection, break-away function
- Dry-break connection/disconnection
- Connection guiding system and compensation of misalignment during connection on rack systems (when both are mounted on rigid devices)
- Specific design for cooling applications



# Parker Fluid Connectors Group

**Your complete source** for quality tube fittings, hose & hose fittings, brass & composite fittings, quick-disconnect couplings, valves and assembly tools, locally available from a worldwide network of authorized distributors.

## **Fittings:**

Available in inch and metric sizes covering SAE, BSP, DIN, GAZ, JIS and ISO thread configurations, manufactured from steel, stainless steel, brass, aluminum, nylon and thermoplastic.

## **Hose, Tubing and Bundles:**

Available in a wide variety of sizes and materials including rubber, wire-reinforced, thermoplastic, hybrid and custom compounds.

## **Worldwide Availability:**

Parker operates Fluid Connectors manufacturing locations and sales offices throughout North America, South America, Europe and Asia-Pacific.

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