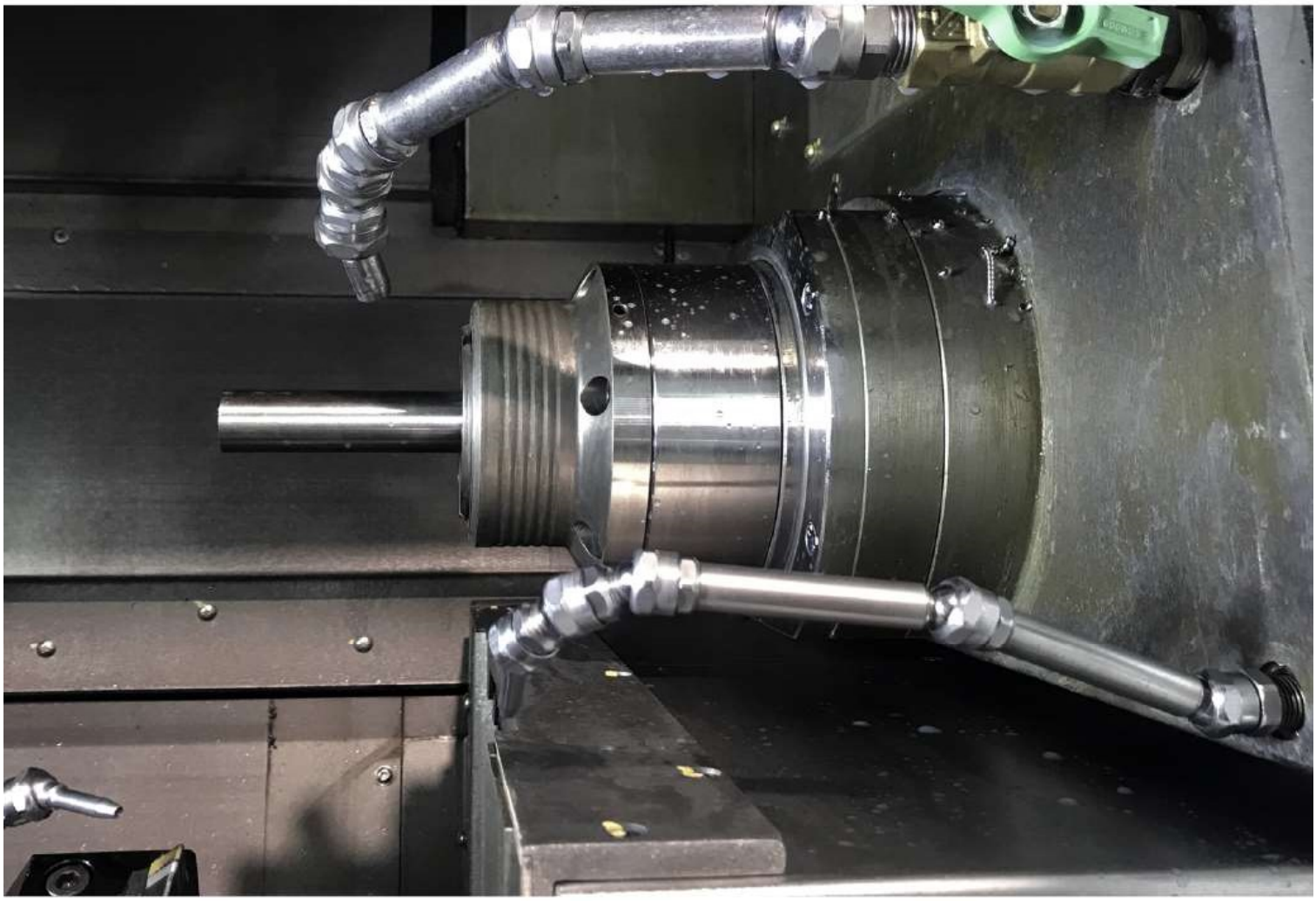
Coolant Distribution



DECA-HECTO-MEGA-GIGA

ARTICULATED STEEL TUBES FOR COOLANT DISTRIBUTION

PRODUCTIVITY AND SAFETY IMPROVEMENTS IN CNC MACHINE-TOOLS

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INDEX

INTRODUCTION

BASIC FEATURES: 4 DIFFERENT PROGRAMS (DIMENSIONS) FOR LOW, MEDIUM AND HIGH-PRESSURE COOLING / AIR BLAST

Modular articulated system for the supply of refrigerant at low, medium or high-pressure. Also useful for air blasting operations. Ideal for both fixed-head and Swiss-type CNC lathes, vertical and horizontal machining centers, grinding or transfer machines

4 manufacturing programs according to the required flow:

- DECA: 3 mm through hole for coolant supply.
- HECT0: 6 mm through hole for coolant supply.
- MEGA: 10.5 mm through hole for coolant supply.
- GIGA: 16 mm through hole for coolant supply.

Pressure (Bar)	DECA (l/min)	HECTO (l/min)	MEGA (l/min)	GIGA (l/min)
2	6	24	73	169
8	12	48	145	338
15	16	65	199	463
20	19	75	230	534
30	23	92	282	654
50	30	119	364	844
80	38	150	460	1068
100	42	168	---	---
150	51	---	---	---

These 4 different programs can be connected with each other and with the MICRO and NANO programs.

Exclusive operation of the mechanism that allows to position and use it with low pressures without the need of tightening of the nuts, even in this mode of operation a total liquid tightness is maintained. For high-pressure work, it must be blocked to ensure stiffness.

It withstands the vibration and pressure of the refrigerant without losing the position. It can be orientated and fixed without the need to use mounting keys.

It allows to work with emulsion or cutting oil or compressed air for cooling or cleaning of the workpiece.

In the “Initial Connection” (IC) parts, BSP threads have 1 mark in the hexagon area and NPT threads have 2 marks. Metric threads have no marks. This marking allows for easy identification.

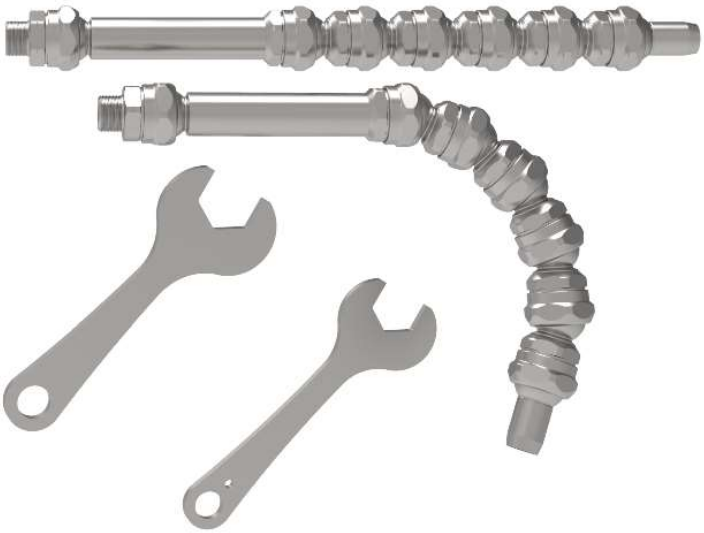
Resistant to pressures of up to 80 bar (1,160 psi) in the programs GIGA and MEGA, 100 bar (1,450 psi) in the program HECTO and 150 bar (2,175 psi) in the program DECA.

DECA PROGRAM

HECTO PROGRAM

MEGA PROGRAM

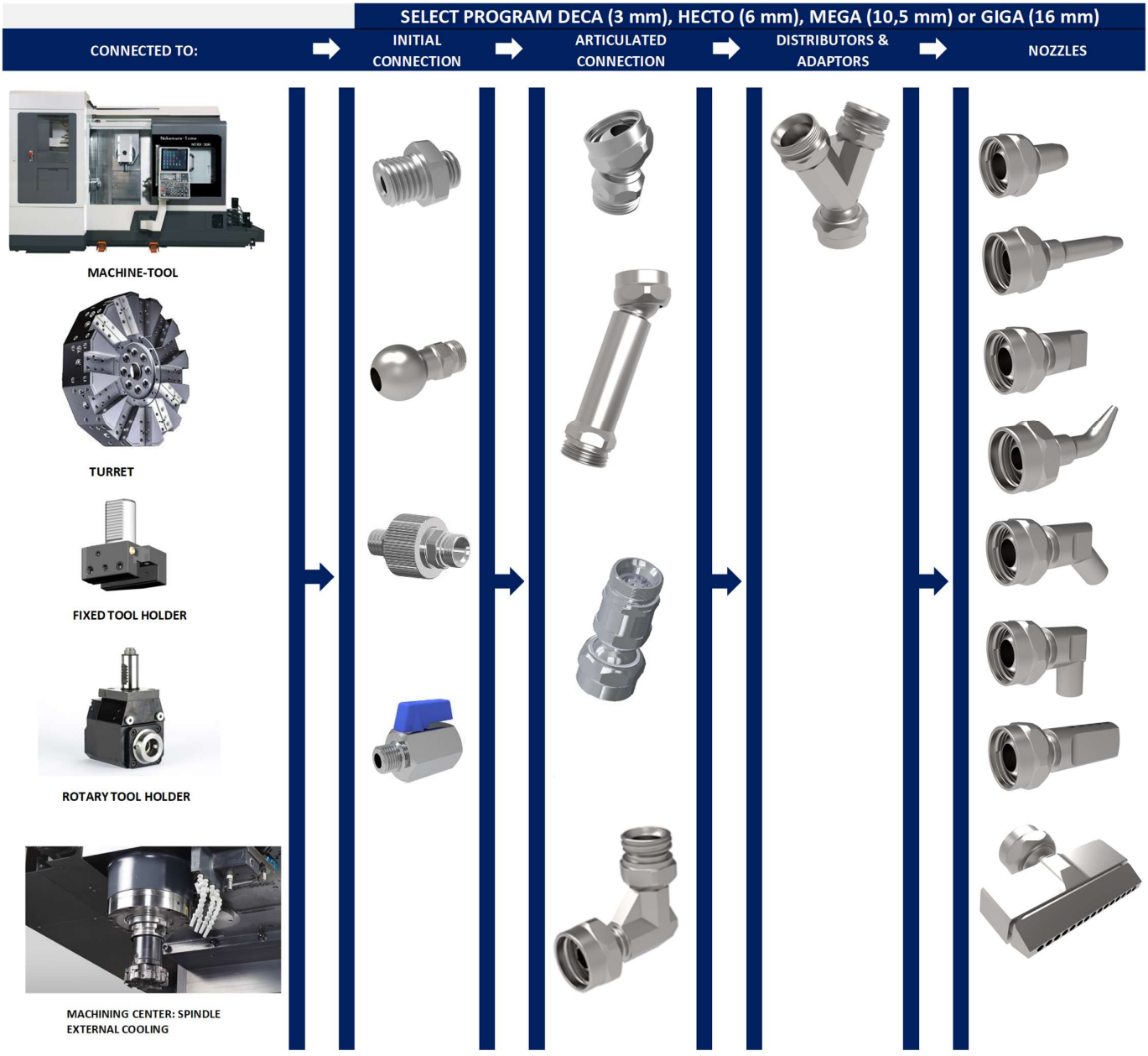
GIGA PROGRAM

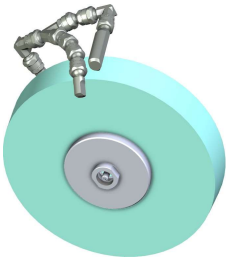


NOTE: *Do not exceed the maximum tightening torque when blocking the parts. We strongly recommend using the specific SCS wrenches for each of the articulated steel programs. Failure to follow these instructions may damage the parts and void the warranty.*

	DECA	HECTO	MEGA	GIGA
Max. Torque:	*1.8 Nm*	*6 Nm*	*28 Nm*	*40 Nm*

ARTICULATED STEEL TUBE SYSTEM ASSEMBLY FOR GENERAL METAL CUTTING APPLICATIONS





ARTICULATED STEEL TUBE SYSTEM ASSEMBLY FOR GRINDING APPLICATIONS

GRINDING MACHINE	INITIAL CONNECTION & VALVES (OPTIONAL)	ARTICULATED CONNECTION	DISTRIBUTORS & ADAPTORS (OPTIONAL)	NOZZLE

Initial connection

Articulated connection

"Y" distributor

90º Nozzle

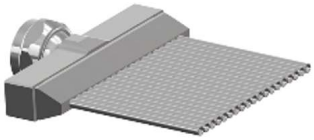
Ball valve

90º connection

Slot Nozzle

Quick connection

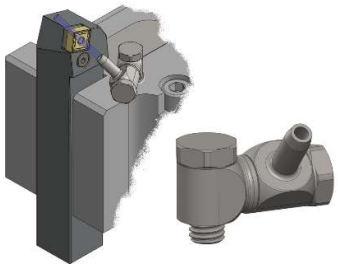
Articulated connection with non-return valve



Tube Nozzle

1. Ideal for low, medium, and high-pressure cooling.
2. Withstands the vibration and pressure of the refrigerant without losing the position.
3. Can be enlarged, shortened, orientated and fixed in position to deliver coolant precisely to the grinding wheel.
4. Total liquid tightness to ensure all the coolant flow is delivered to the tool.
5. Special slot and tube nozzles exclusively designed for grinding applications, with almost no diffusion and able to deliver coolant precisely to the point of contact of the grinding wheel with the workpiece.
6. Eco friendly: Manufactured in high-resistant steel. No plastic disposal and long-life.
7. 4 families: 3 mm, 6 mm, 10.5 mm and 16 mm through hole: meets the coolant requirement for each application.

ARTICULATED STEEL TUBE SYSTEM ASSEMBLY FOR TOOL HOLDERS



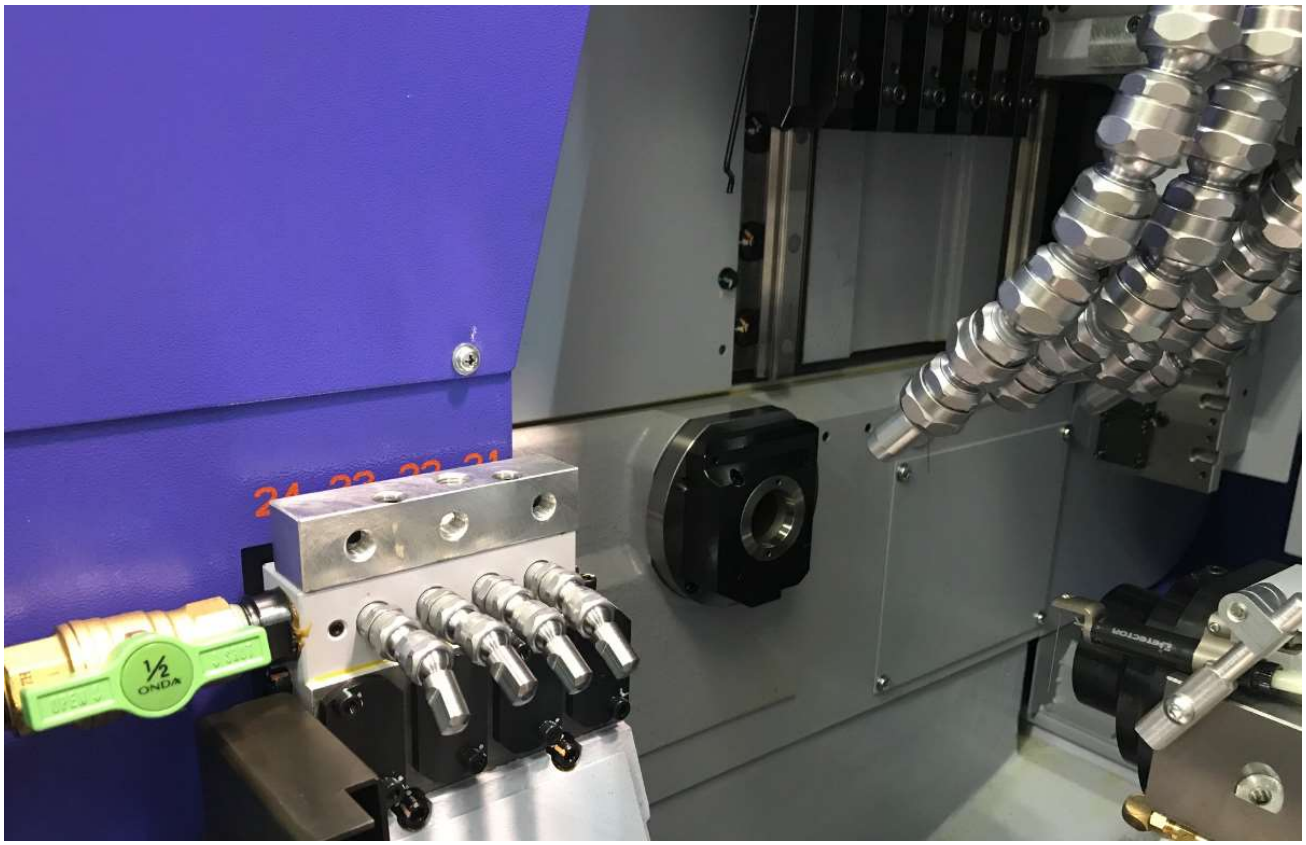
ROTARY OR STEADY TOOL HOLDER:	INITIAL CONNECTION	ARTICULATED CONNECTION (optional)	DISTRIBUTORS & ADAPTORS (optional)	NOZZLES (DECA or HECTO)
 ROTARY TOOL HOLDER	 THREADED INITIAL CONNECTION DECA / HECTO	 ARTICULATED CONNECTION DECA / HECTO SWIVEL: ±25°	 60° ARTICULATED "Y" CONNECTION DECA / HECTO SWIVEL: ±25°	 NOZZLES DDECA / HECTO SWIVEL: ±25°
 STEADY TOOL HOLDER	 BALL INITIAL CONNECTION DECA / HECTO	 90° ARTICULATED CONNECTION DECA / HECTO SWIVEL: ±25°		
	 BANJO BOLT+BANJO HECTO			
	 BALL INITIAL CONNECTION M6x1 FOR 2-AXIS NOZZLE DECA			 2-AXIS NOZZLE M6x1 DECA

1. Ideal for medium and high-pressure cooling.
2. Can be orientated and fixed precisely to deliver coolant to the tip of the tool.
3. No mechanical play in coolant delivery ball nozzles as everything is manufactured in highly-resistant steel.
4. Total liquid tightness to ensure all the coolant flow is delivered to the tool. Can be used for air blast cleaning too.
5. Can be enlarged, shortened and with multiple nozzle shapes to provide the ideal coolant delivery for each tool and application.
6. Eco friendly: Manufactured in high-resistant steel. No plastic disposal and long-life.
7. 3 or 6 mm through hole: minimum space required and maximum coolant flow.

Coolant Distribution

INSTALLATION - EXAMPLES

Example of installation in a Swiss-type lathe



HECTO system mounted for tool back-post cooling

MEGA system mounted for main spindle cooling

Assembly HECTO (6 mm):

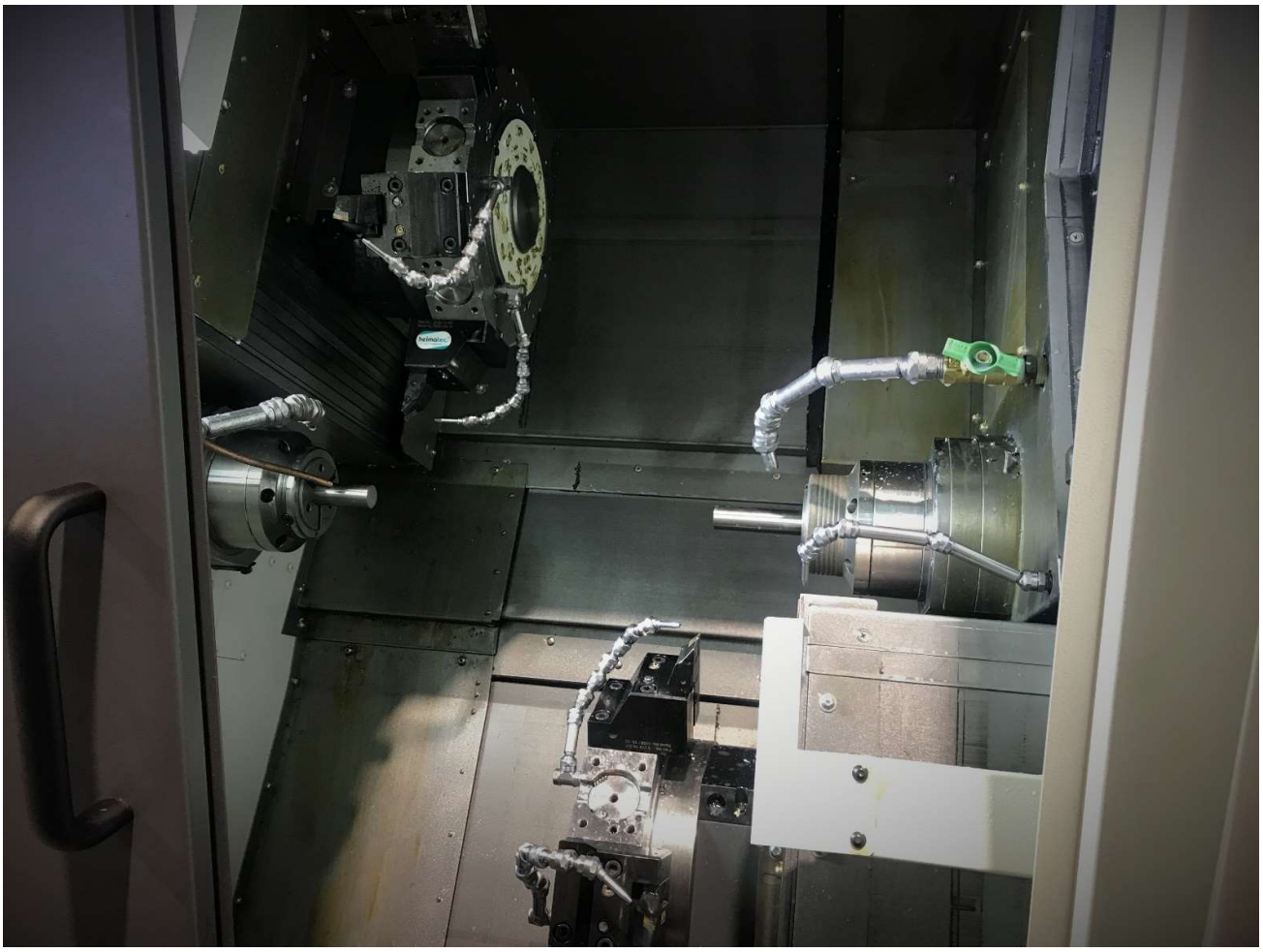
4 x 1 unit HE-IC-01-08 BSPT 1/4"(M) to articulated connection
4 x 1 unit HE-AC-01-00 Articulated connection L:20.5 mm
4 x 1 unit HE-NZ-03-00 Nozzle 90º. ID:3.4 mm x 3 & L:24 mm

Assembly MEGA (10.5 mm):

4 x 1 unit ME-IC-01-04 BSPT 3/8"(M) to articulated connection
4 x 4 unit ME-AC-01-00 Articulated connection L:28.5 mm
4 x 1 ME-AC-01-02 Articulated connection L=128.5 mm
4 x 1 unit ME-NZ-01-00 Straight nozzle. ID:10.5 mm & L:27 mm

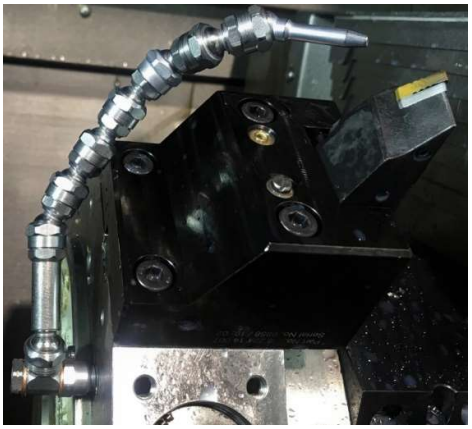
2 x 1 unit ME-IC-01-04 BSPT 3/8"(M) to articulated connection
2 x 1 unit ME-NZ-01-00 Straight nozzle. ID:10.5 mm & L:27 mm

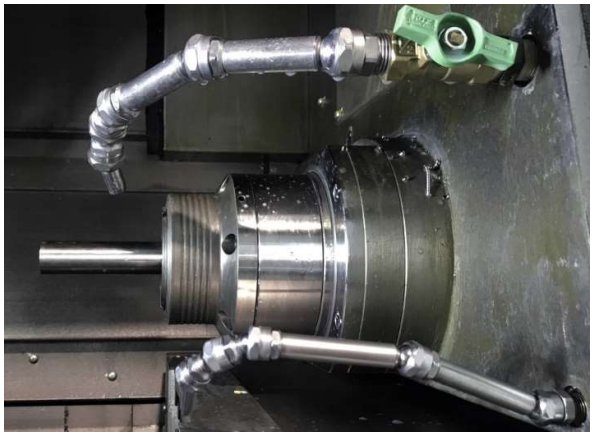
Example of installation in a 2-Spindle and 2-turret CNC lathe



HECTO system mounted for tool cooling from turret disc

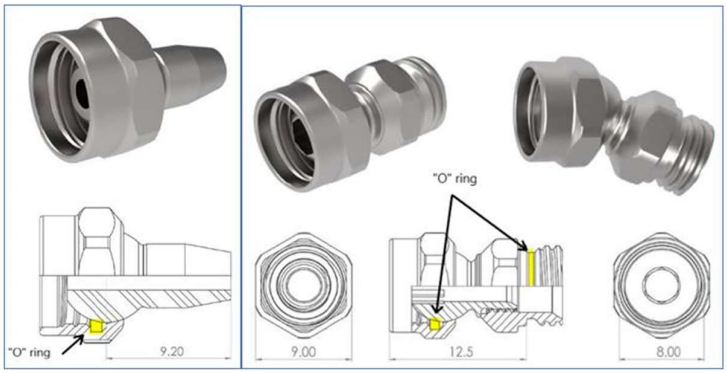
MEGA system mounted for main spindle and sub spindle chuck cleaning and cooling





Example of air blasting application in a CNC lathe

HECTO system mounted for air blasting of 2 jaw-chuck in sub spindle of CNC lathe before part transfer from main spindle.



Perfect application for air blasting: no leaks thanks to “O” ring seals, even with the system not firmly fixed.

Example of installation in rotary tool holders for a CNC lathe

DECA system mounted in rotary tool holder 60º Distributor and 2 x Nozzle curved 45º ID:2 mm & L:20 mm

DECA system mounted in rotary tool holder. Straight nozzle ID:3 mm & L:20 mm

DECA system mounted in rotary tool holder. Straight nozzle ID:2 mm & L:20 mm

HECTO system mounted in rotary tool holder. Straight nozzle coaxial ID:3.4 x 3 & L=20 mm

DECA (3 mm) PROGRAM

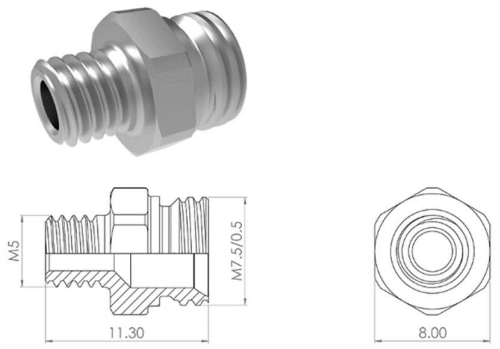
The internal through hole of the DECA program is 3 mm and is ideal for the distribution of refrigerant (oil or emulsion) in small-sized machines such as Swiss-type CNC lathes, fixed-head CNC lathes, driven tools or as distribution branches of bigger programs (HECTO, MEGA or GIGA).
Maximum torque for locking the parts of the system: 1.8 Nm
Maximum pressure: 150 Bar (2,175 psi)

INITIAL CONNECTION

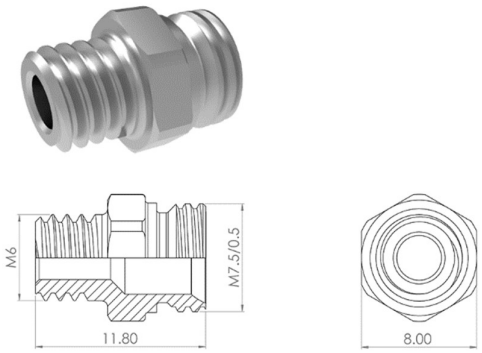
DE-IC-01 (Male to DECA)

Male thread connection elements to connect to the machine-tool or other SCS coolant distribution programs. ID:3 mm.
Material: Steel

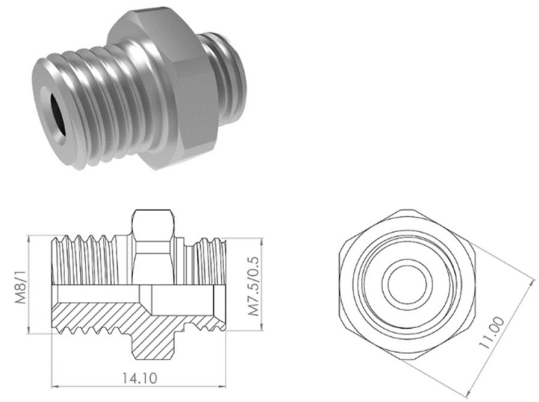
Ref.	Description
DE-IC-01-01	M5x0.8(M) to articulated connection DECA.
DE-IC-01-02	M6x1(M) to articulated connection DECA.
DE-IC-01-00	M8x1(M) to articulated connection DECA.
DE-IC-01-06	M8x1 keg(M) to articulated connection DECA.
DE-IC-01-03	M10x1(M) to articulated connection DECA.
DE-IC-01-12	M10x1(M) with 10 mm hexagon to articulated connection DECA.
DE-IC-01-07	M10x1 keg(M) to articulated connection DECA.
DE-IC-01-11	M10x1.5(M) to articulated connection DECA.
DE-IC-01-14	M10x1.5(M) with 10 mm hexagon to articulated connection DECA.
DE-IC-01-04	BSPP 1/8"(M) to articulated connection DECA.
DE-IC-01-13	BSPP 1/8"(M) with 10 mm hexagon to articulated connection DECA.
DE-IC-01-08	BSPT 1/8"(M) to articulated connection DECA.
DE-IC-01-05	BSPT 1/4"(M) to articulated connection DECA.
DE-IC-01-09	NPT 1/8"(M) to articulated connection DECA.
DE-IC-01-10	NPT 1/4"(M) to articulated connection DECA.



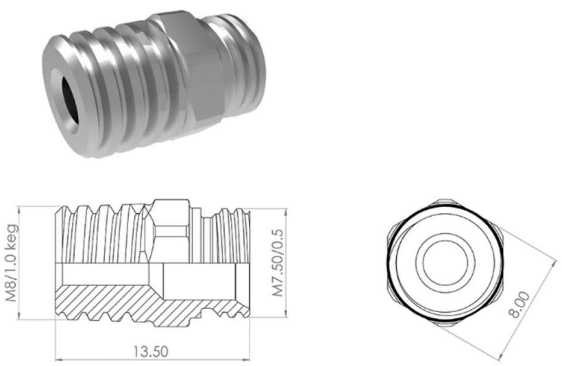
DE-IC-01-01



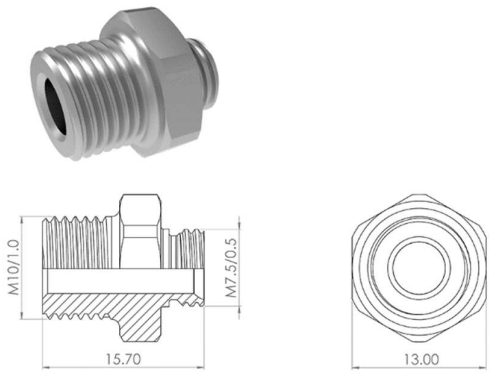
DE-IC-01-02



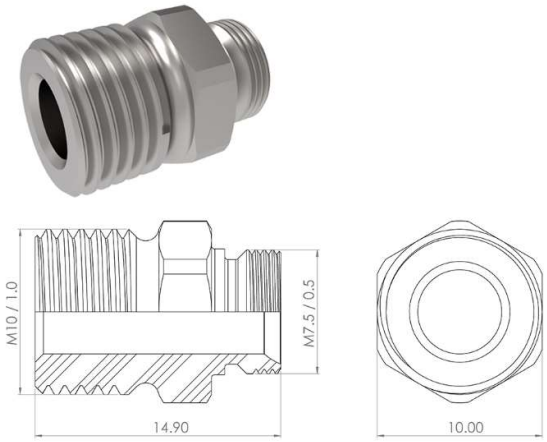
DE-IC-01-00



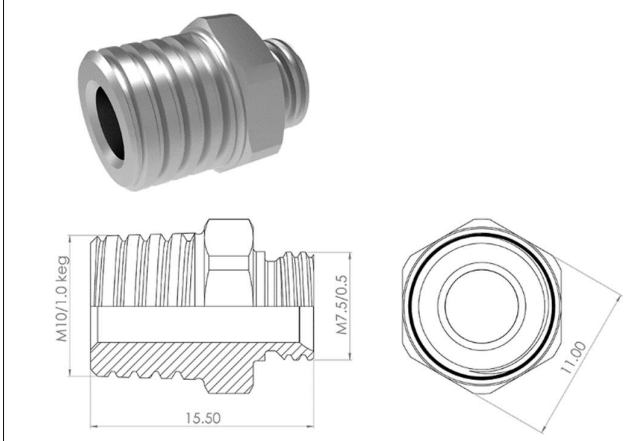
DE-IC-01-06



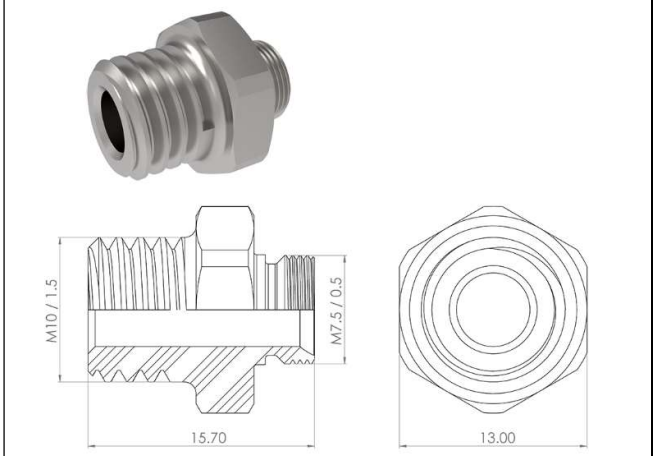
DE-IC-01-03



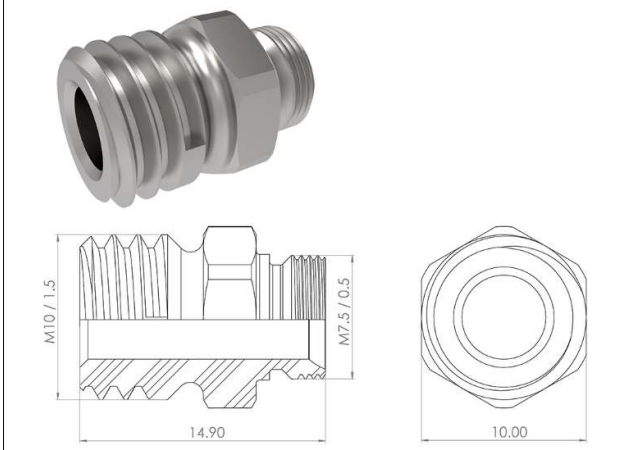
DE-IC-01-12



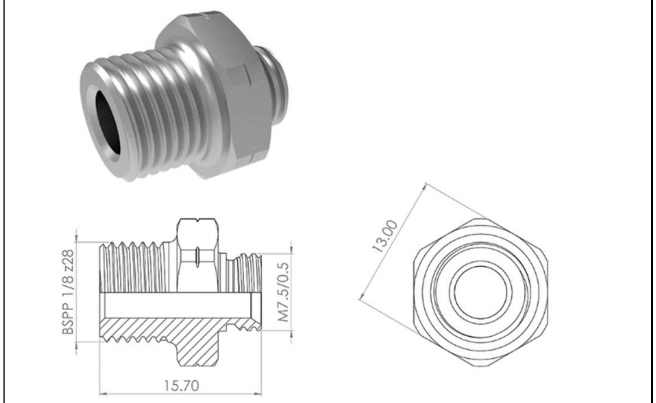
DE-IC-01-07



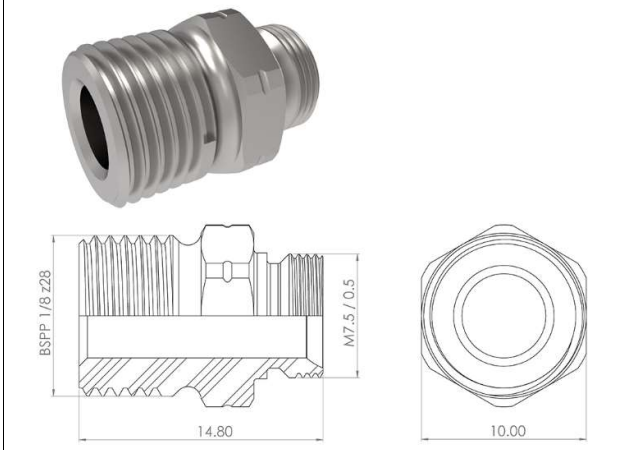
DE-IC-01-11



DE-IC-01-14



DE-IC-01-04



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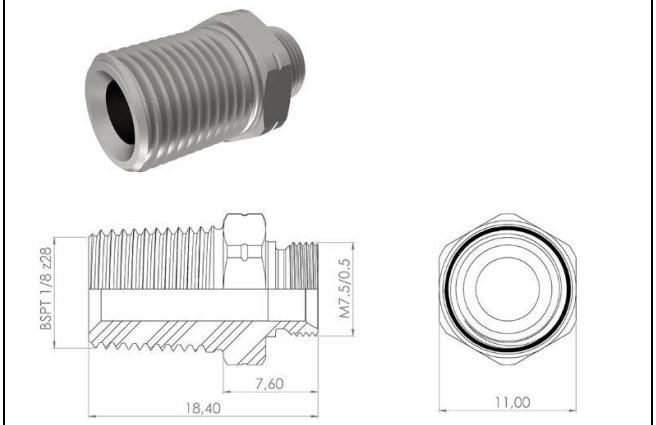
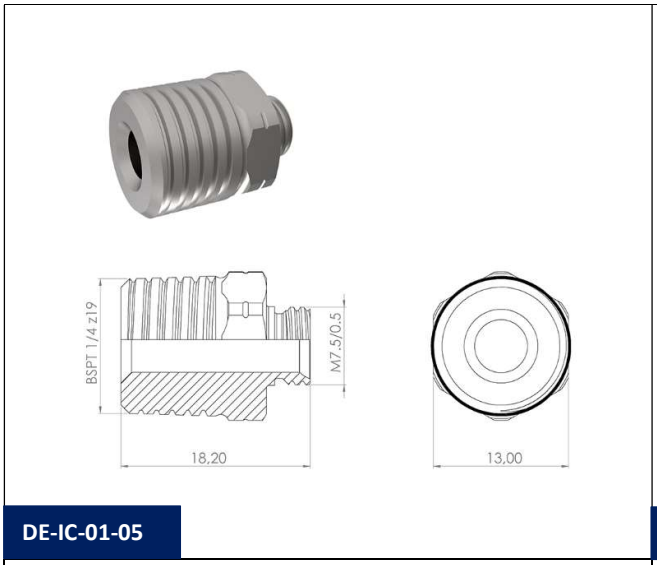
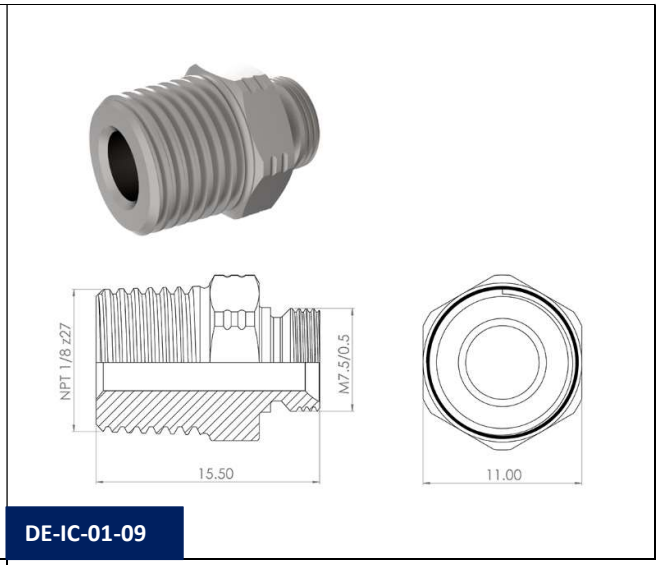


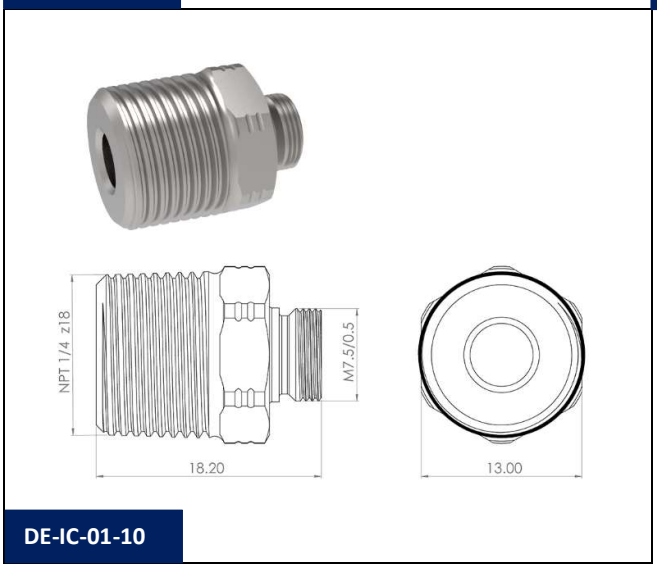
DE-IC-01-08



DE-IC-01-05



DE-IC-01-09

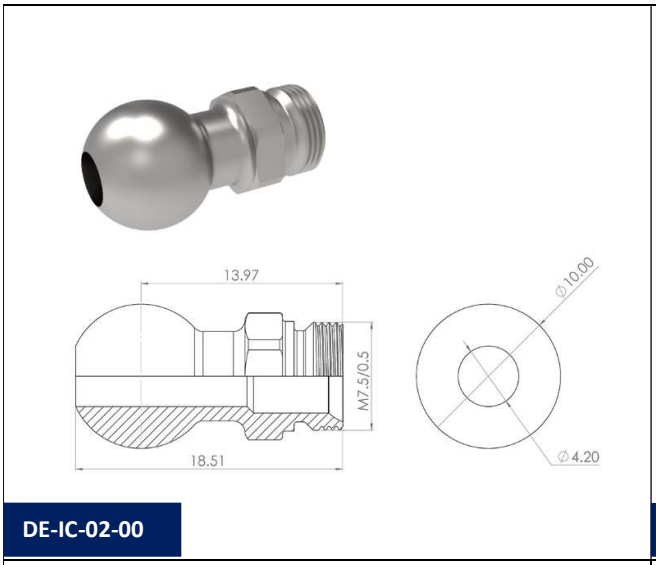


DE-IC-01-10

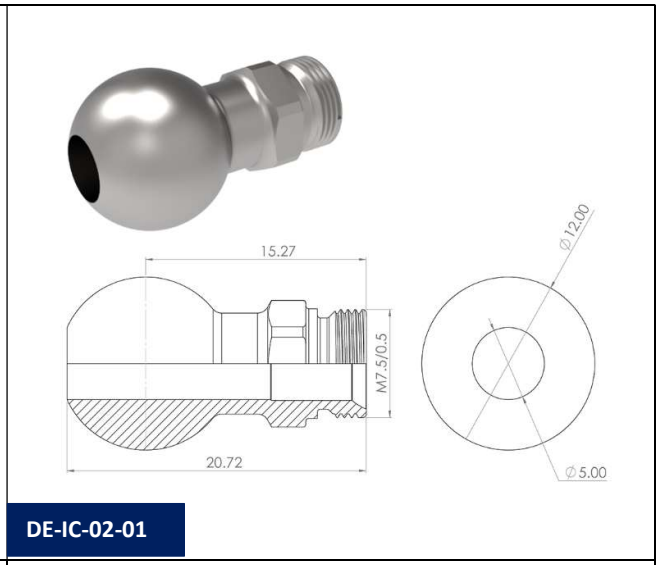
DE-IC-02 (Ball to DECA)

Ball connection elements to tool holders. ID:3 mm.
Material: Steel

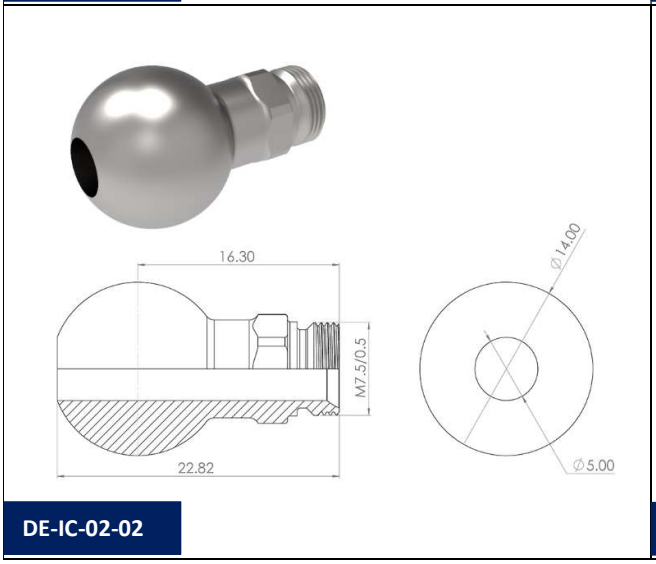
Ref.	Description
DE-IC-02-00	Ball OD:10 mm to articulated connection DECA.
DE-IC-02-01	Ball OD:12 mm to articulated connection DECA.
DE-IC-02-02	Ball OD:14 mm to articulated connection DECA.
DE-IC-02-03	Ball OD:15 mm to articulated connection DECA.



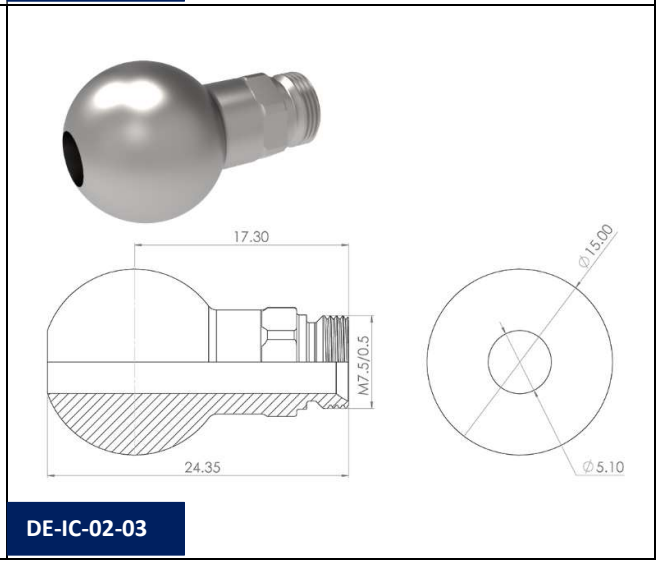
DE-IC-02-00



DE-IC-02-01



DE-IC-02-02

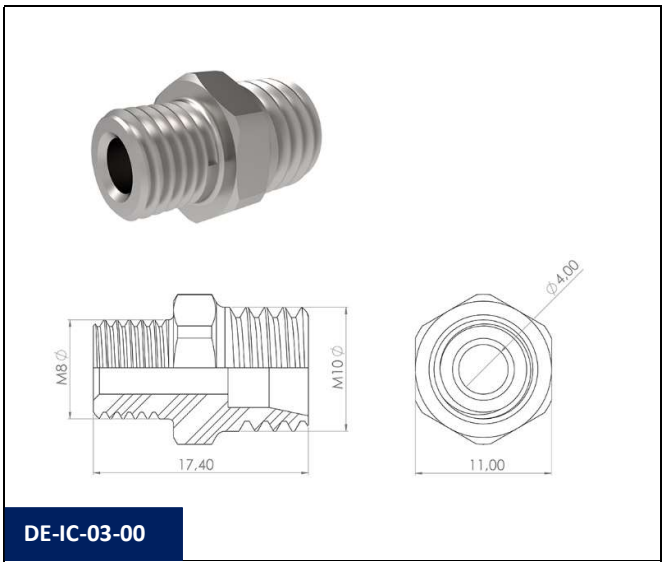


DE-IC-02-03

DE-IC-03 (Male to Nut for compression ring)

Male thread connection elements to integrate a Compression ring (DE-DA-04 Fig. 3) and together with a Nut DECA (DE-DA-04 Fig. 2) clamp a copper or steel tube. ID:3 mm. To connect to the machine-tool or tool holder.
Material: Steel

Ref.	Description
DE-IC-03-00	M8x1(M) to Nut for compression ring ID:6 mm DECA.

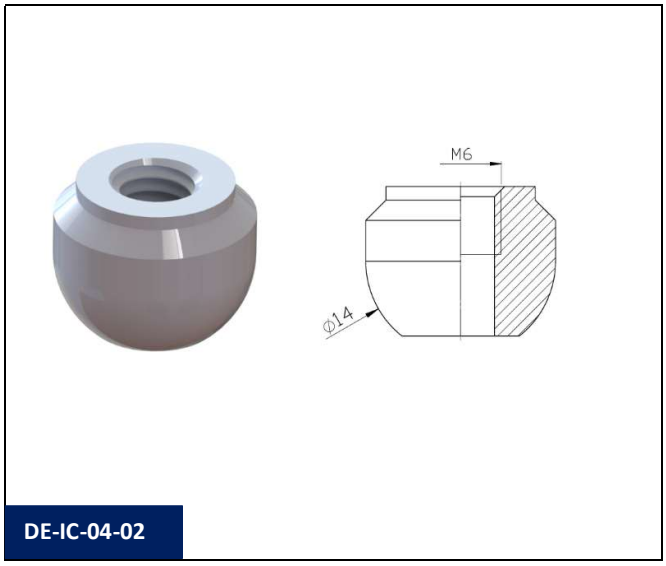


DE-IC-03-00

DE-IC-04 (Ball to Female)

Ball connection elements to 2-axis articulated nozzle for tool holders DE-NZ-06. ID:3 mm.
Material: Steel

Ref.	Description
DE-IC-04-02	Ball OD:14 mm to M6x1(F) for 2-axis articulated nozzle DE-NZ-06



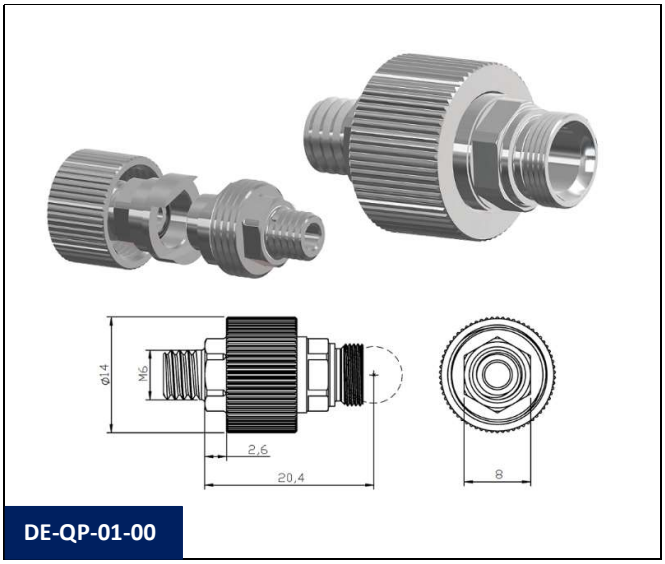
DE-IC-04-02

QUICK POSSITIONED CONNECTIONS

DE-QP-01 (Male to DECA)

Positioned quick connection to substitute initial connection DE-IC-01. ID:3 mm.
Material: Steel

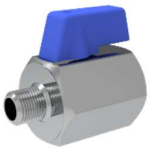
Ref.	Description
DE-QP-01-00	Quick connection positioned M6x1(M) to articulated connection DECA.



DE-QP-01-00

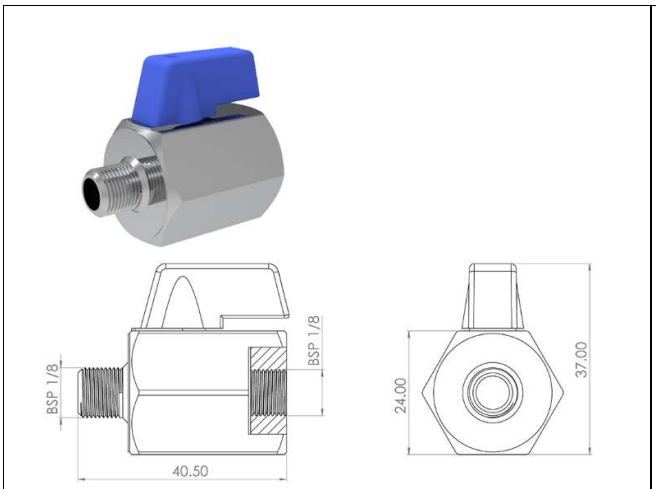
BALL VALVES

UN-VA-01 (PN10 – Male to Female)

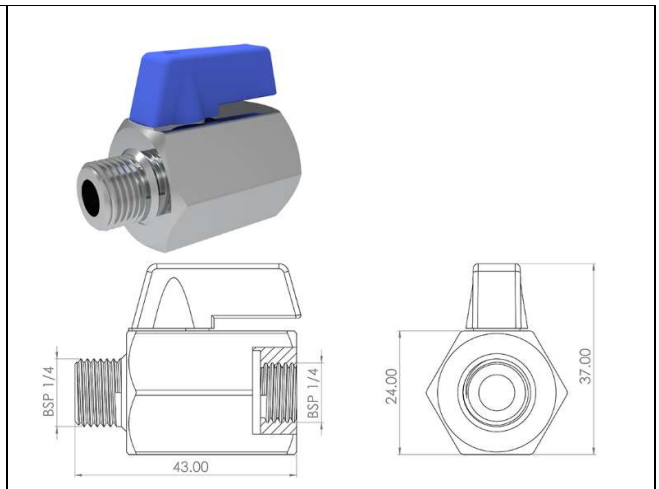


Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 10 bar (145 psi).
Material: Chrome plated brass.

Ref.	Description
UN-VA-01-00	Closing valve PN10, BSPP 1/8"(M) and BSPP 1/8"(F) chromed-plated brass.
UN-VA-01-01	Closing valve PN10, BSPP 1/4"(M) and BSPP 1/4"(F) chromed-plated brass.



UN-VA-01-00

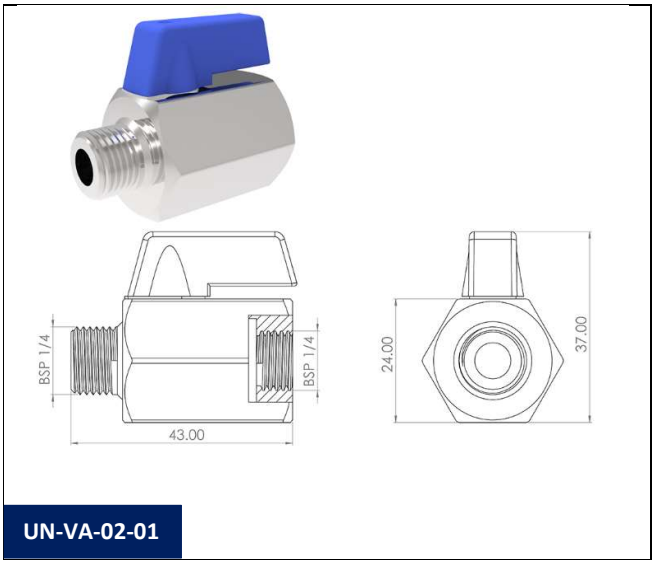


UN-VA-01-01

UN-VA-02 (PN63 – Male to Female)

Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 63 bar (914 psi).
Material: Stainless steel AISI-316

Ref.	Description
UN-VA-02-01	Closing valve PN63, BSPP 1/4"(M) and BSPP 1/4"(F) AISI-316



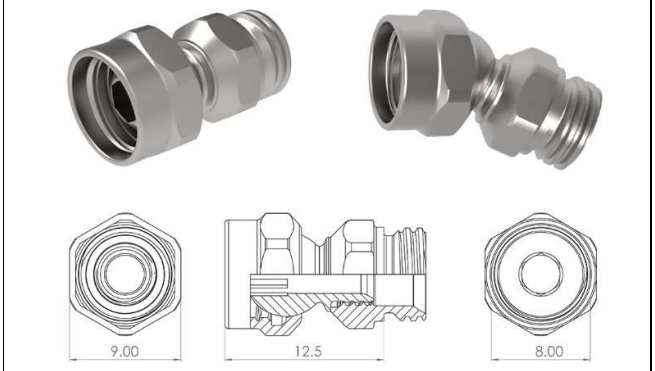
UN-VA-02-01

ARTICULATED CONNECTIONS

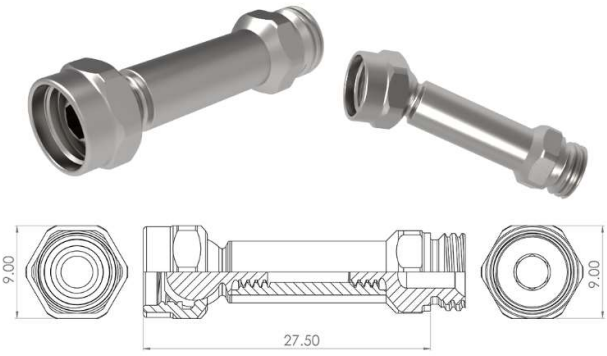
DE-AC-01 (Straight connection)

Basic straight articulated elements which connect to an initial connection, to another articulated connection, to a quick positioned connection or to a nozzle. Swiveling ±25º. ID:3 mm.
Material: Steel

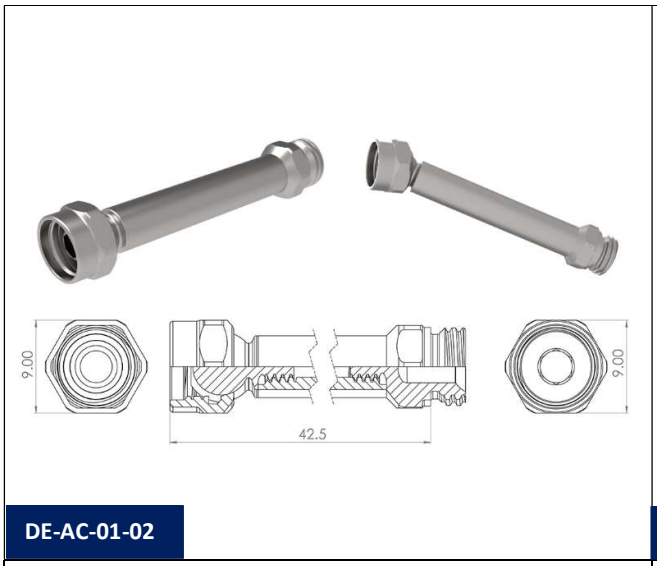
Ref.	Description
DE-AC-01-00	Articulated connection DECA L:12.5 mm
DE-AC-01-01	Articulated connection DECA L:27.5 mm
DE-AC-01-02	Articulated connection DECA L:42.5 mm
DE-AC-01-03	Articulated connection DECA L:57.5 mm
DE-AC-01-04	Articulated connection DECA L:72.5 mm



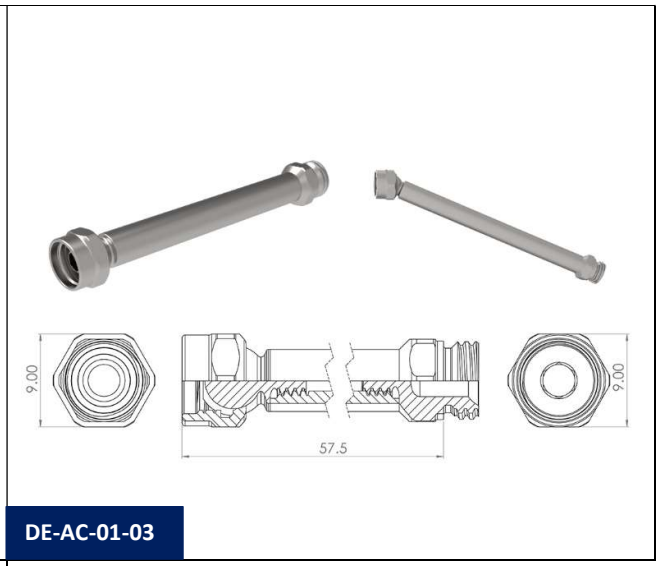
DE-AC-01-00



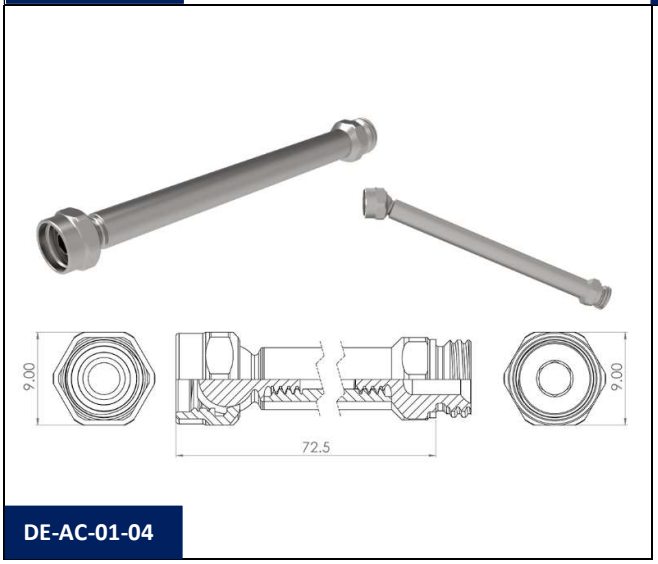
DE-AC-01-01



DE-AC-01-02



DE-AC-01-03

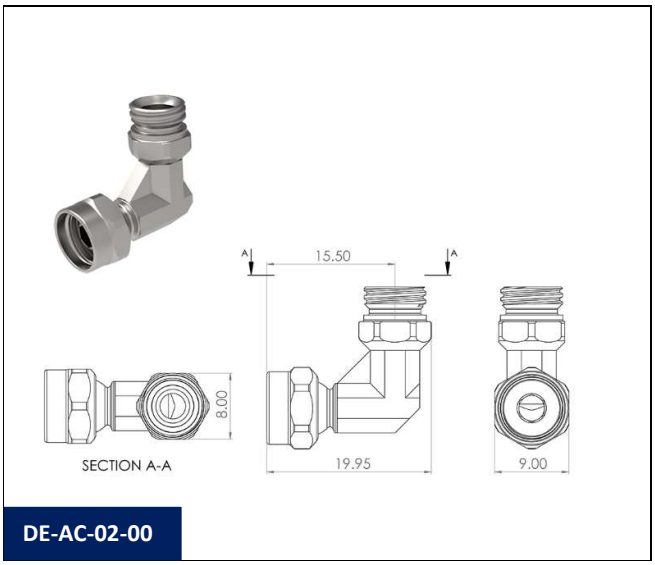


DE-AC-01-04

DE-AC-02 (90º connection)

90º articulated elements which connect to an initial connection, to a straight connection, to a quick positioned connection or to a nozzle. Swiveling ±25º. ID:3 mm.
Material: Steel

Ref.	Description
DE-AC-02-00	Articulated connection to 90º DECA



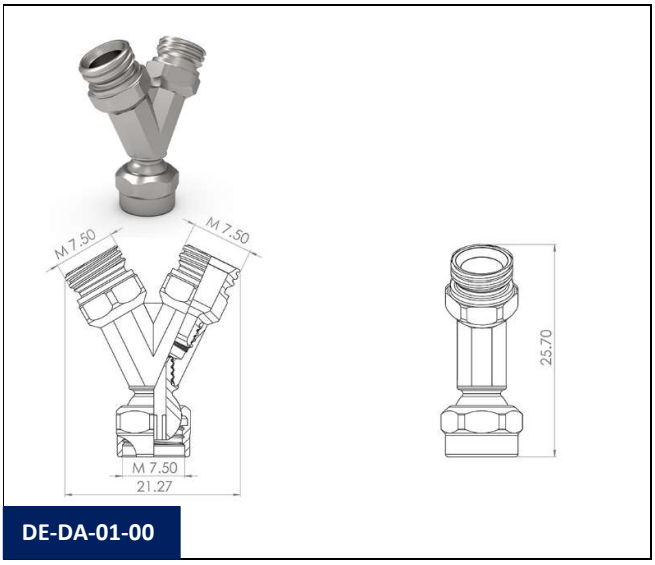
DE-AC-02-00

DISTRIBUTORS, ADAPTORS, NUTS AND COMPRESSION RINGS

DE-DA-01 (60º Split distributor)

Coolant split distributor 60º (“Y” type). Expansion of articulated lines and adaption to other SCS coolant distribution systems.
Material: Steel

Ref.	Description
DE-DA-01-00	“Y” distributor to articulated connection DECA

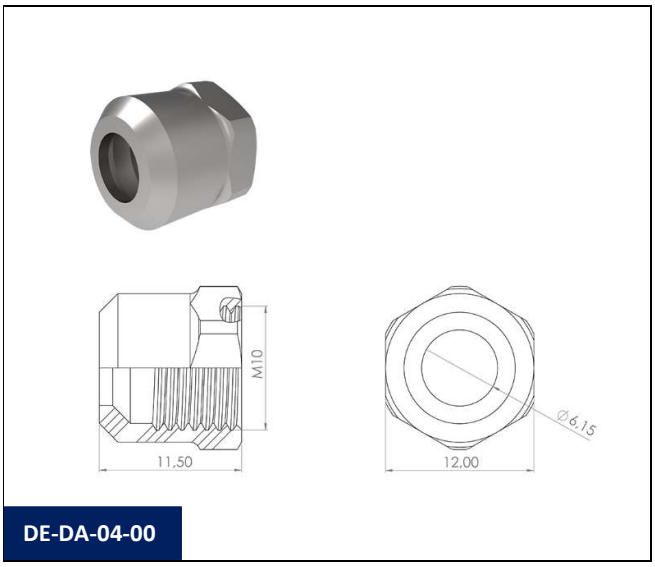


DE-DA-01-00

DE-DA-04 Fig. 1 (Nut)

Nut DECA to clamp a copper or steel tube together with a Compression ring (DE-DA-04 Fig. 3) and Adaptor DECA to Nut (DE-DA-04 Fig. 2)
Material: Steel

Ref.	Description
DE-DA-04-00	Nut DECA(F) for compression ring ID:6 mm

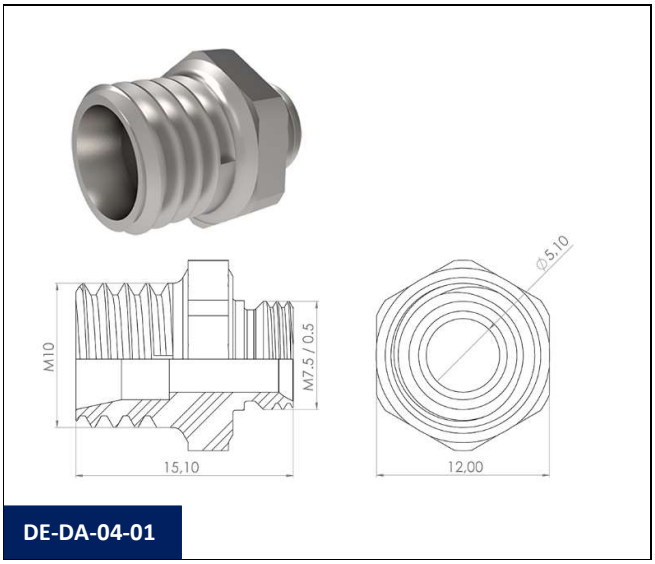


DE-DA-04-00

DE-DA-04 Fig. 2 (Adaptor DECA to Nut)

Adaptor DECA to Nut to clamp a copper or steel tube together with a Nut DECA and Compression ring (DE-DA-04 Fig. 3). To connect to other Articulated connections (DE-AC-01 or DE-AC-02) or to Distributors (DE-DA-01).
Material: Steel

Ref.	Description
DE-DA-04-01	Adaptor DECA(M) to Nut for compression ring ID:6 mm

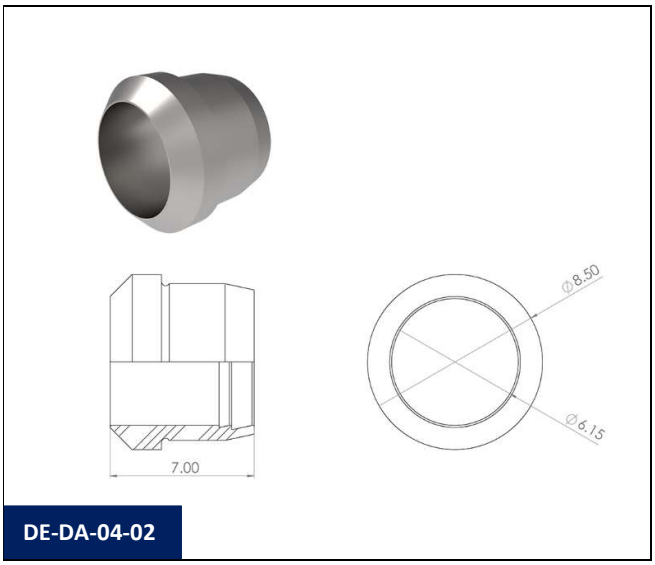


DE-DA-04-01

DE-DA-04 Fig. 3 (Compression ring)

Compression ring to clamp a copper or steel tube together with a Nut DECA (DE-DA-04 Fig.1) and Adaptor DECA to Nut (DE-DA-04 Fig. 2)
Material: Steel

Ref.	Description
DE-DA-04-02	Compression ring ID:6 mm.



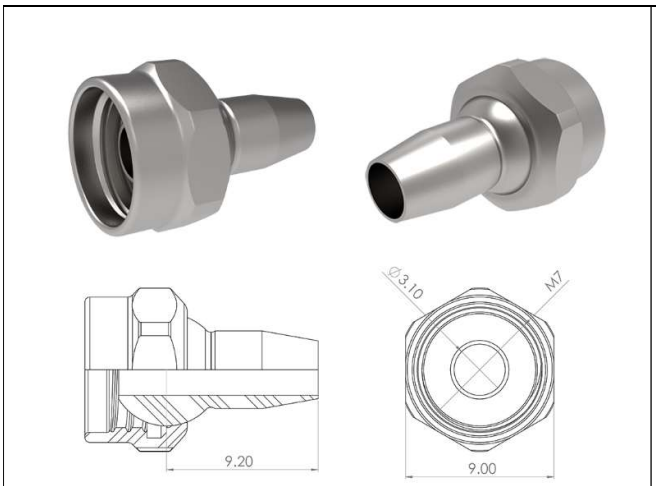
DE-DA-04-02

NOZZLES

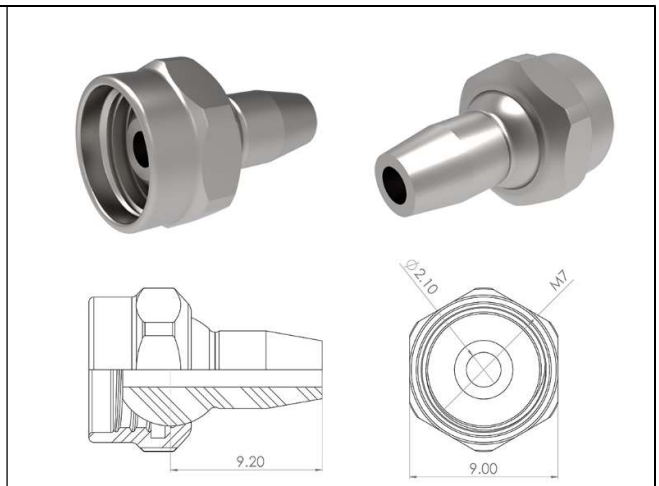
DE-NZ-01 Fig. 1 (Straight short nozzle)

Straight short nozzles with different outlet diameters to meet different coolant delivery requirements.
Material: Steel

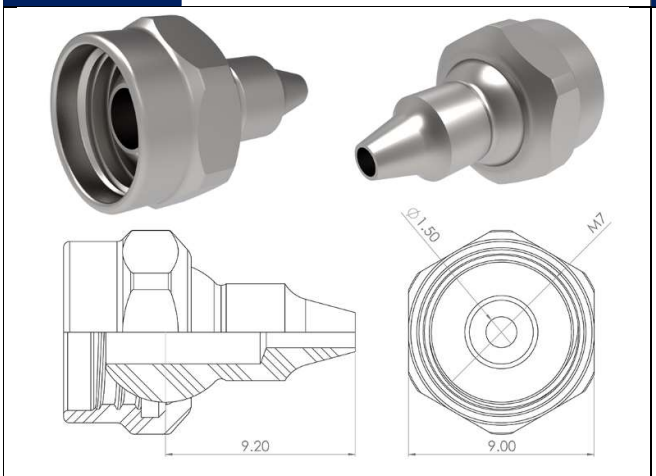
Ref.	Description
DE-NZ-01-00	Straight nozzle ID:3 mm & L:9 mm
DE-NZ-01-01	Straight nozzle ID:2 mm & L:9 mm
DE-NZ-01-06	Straight nozzle ID:1.5 mm & L:9 mm
DE-NZ-01-07	Straight nozzle ID:1 mm & L:9 mm
DE-NZ-01-10	Straight nozzle ID:0 mm & L:9 mm



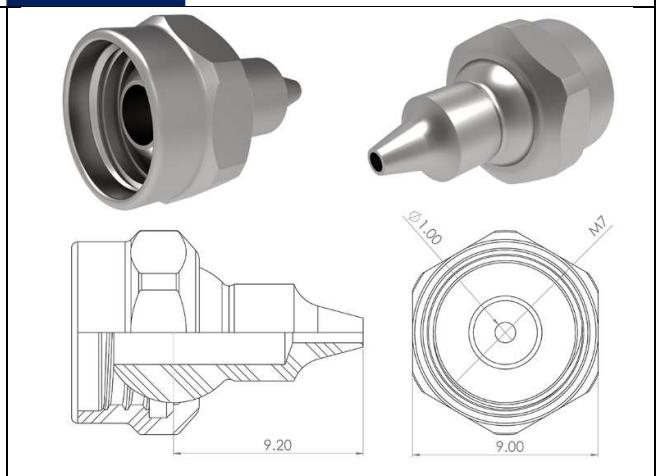
DE-NZ-01-00



DE-NZ-01-01



DE-NZ-01-06

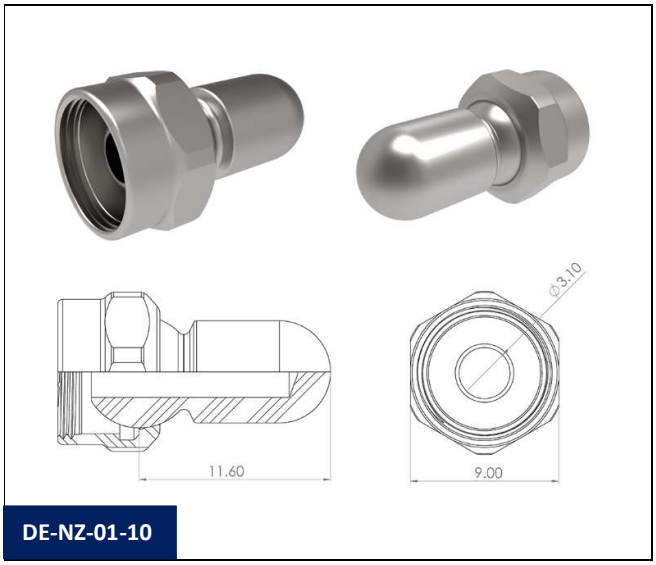


DE-NZ-01-07

DE-NZ-01 Fig. 2 (Blind short nozzle)

Short nozzle prepared to be drilled by the end-user to the required outlet diameter
Material: Steel

Ref.	Description
DE-NZ-01-10	Straight nozzle ID:0 mm & L:9 mm

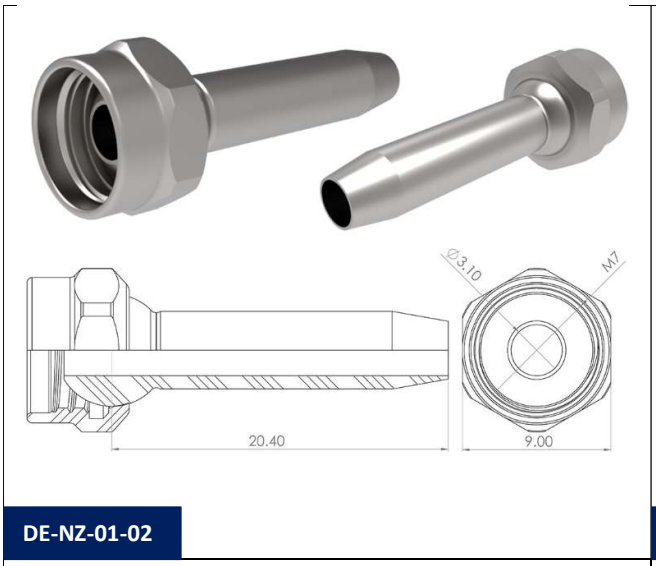


DE-NZ-01-10

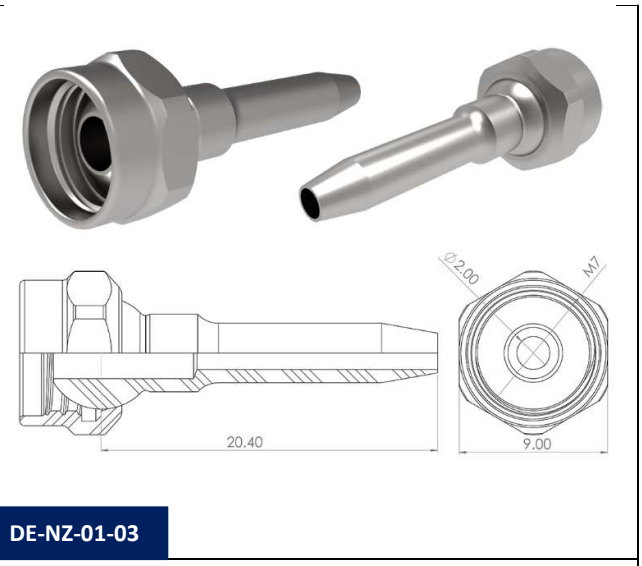
DE-NZ-01 Fig. 3 (Straight long nozzle)

Straight long nozzles with different outlet diameters to meet different coolant delivery requirements.
Material: Steel

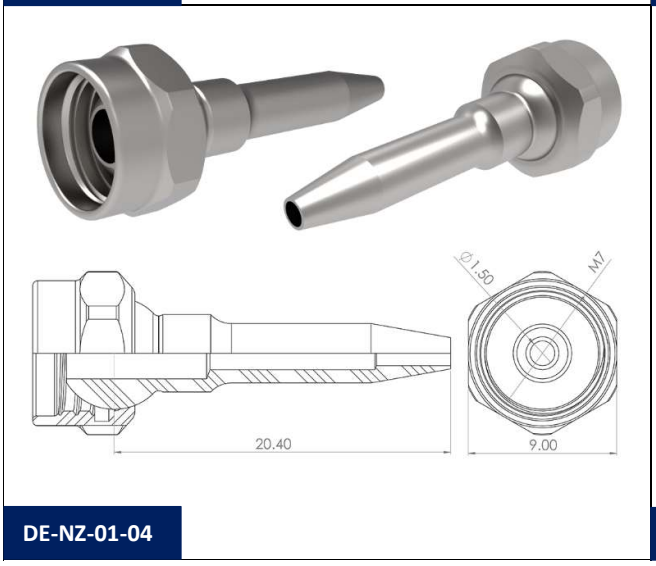
Ref.	Description
DE-NZ-01-02	Straight nozzle ID:3 mm & L:20 mm
DE-NZ-01-03	Straight nozzle ID:2 mm & L:20 mm
DE-NZ-01-04	Straight nozzle ID:1.5 mm & L:20 mm
DE-NZ-01-05	Straight nozzle ID:1 mm & L:20 mm



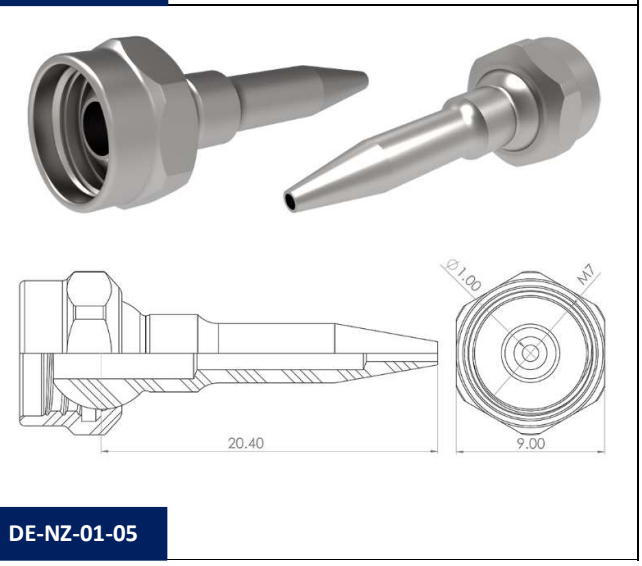
DE-NZ-01-02



DE-NZ-01-03



DE-NZ-01-04

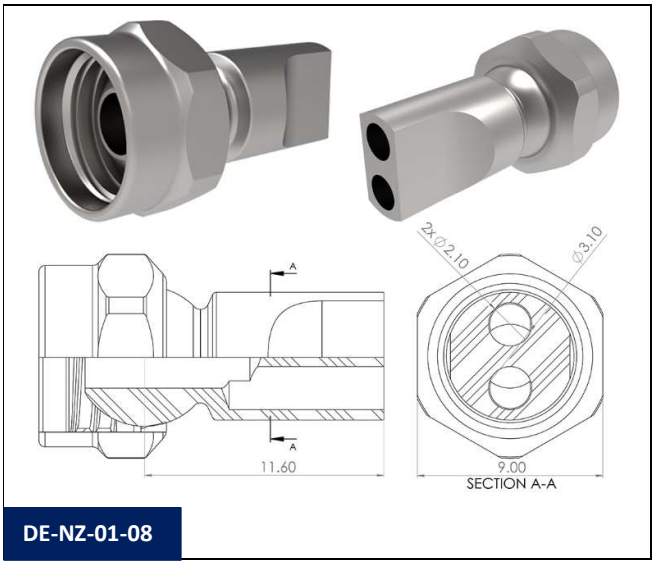


DE-NZ-01-05

DE-NZ-01 Fig. 4 (Straight nozzle multiple linear outlet)

Straight nozzles with multiple outlet holes to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
DE-NZ-01-08	Straight nozzle ID:2 mm x 2 & L:12 mm

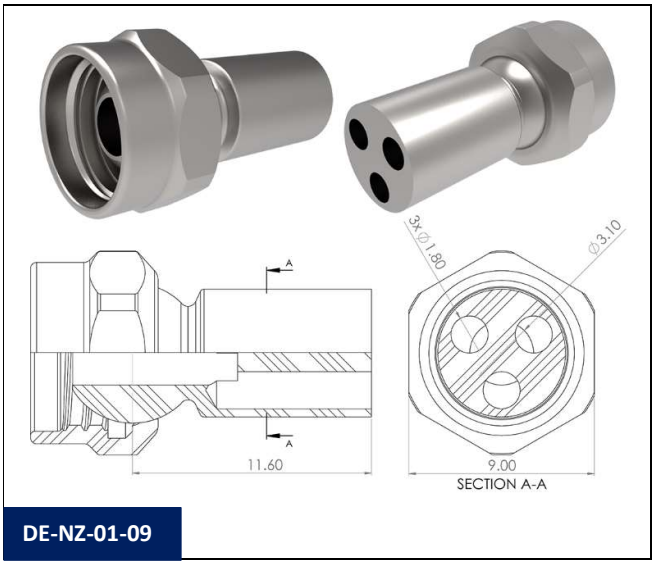


DE-NZ-01-08

DE-NZ-01 Fig. 5 (Straight nozzle coaxial outlet)

Straight coaxial nozzles with multiple outlet holes to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
DE-NZ-01-09	Straight nozzle ID:1.8 mm x 3 & L:12 mm

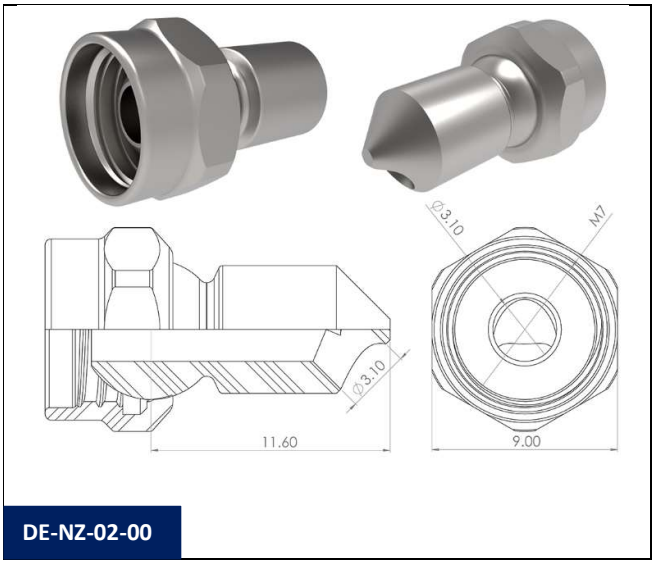


DE-NZ-01-09

DE-NZ-02 Fig. 1 (45º simple nozzle)

Nozzle with 45º hole outlet for angled coolant delivery requirements.
Material: Steel

Ref.	Description
DE-NZ-02-00	Nozzle 45º simple ID:3 mm & L:15 mm

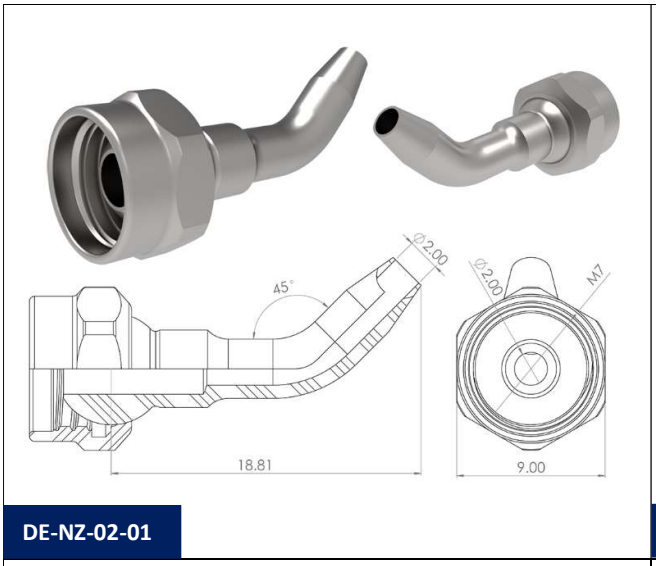


DE-NZ-02-00

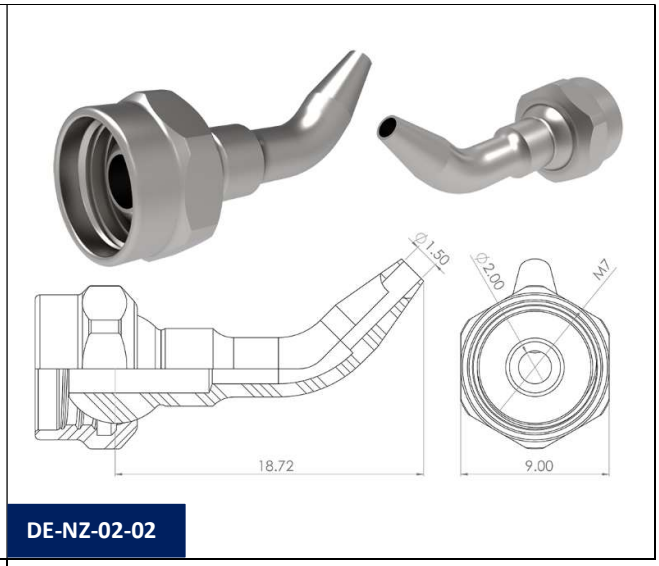
DE-NZ-02 Fig. 2 (45º curved nozzle)

Nozzle curved 45º with different outlet diameters to meet different angled coolant delivery requirements.
Material: Steel

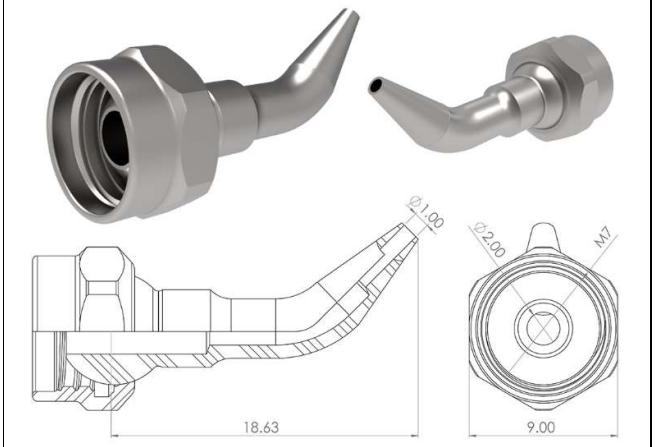
Ref.	Description
DE-NZ-02-01	Nozzle curved 45º ID:2 mm & L:20 mm
DE-NZ-02-02	Nozzle curved 45º ID:1.5 mm & L:20 mm
DE-NZ-02-03	Nozzle curved 45º ID:1 mm & L:20 mm



DE-NZ-02-01



DE-NZ-02-02

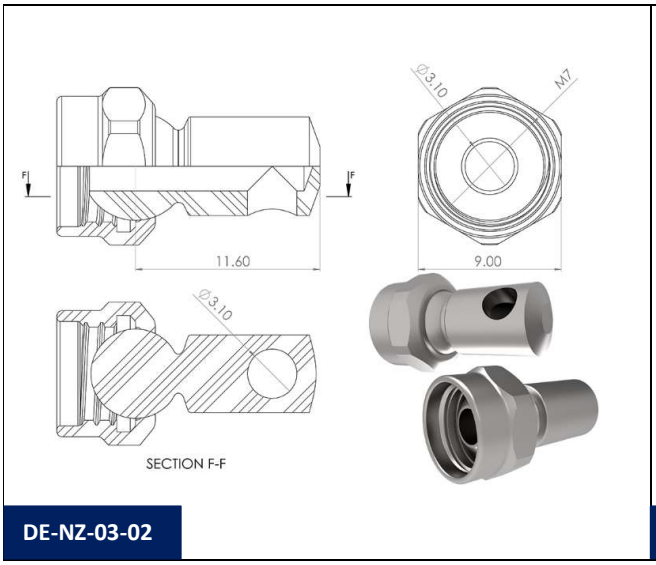


DE-NZ-02-03

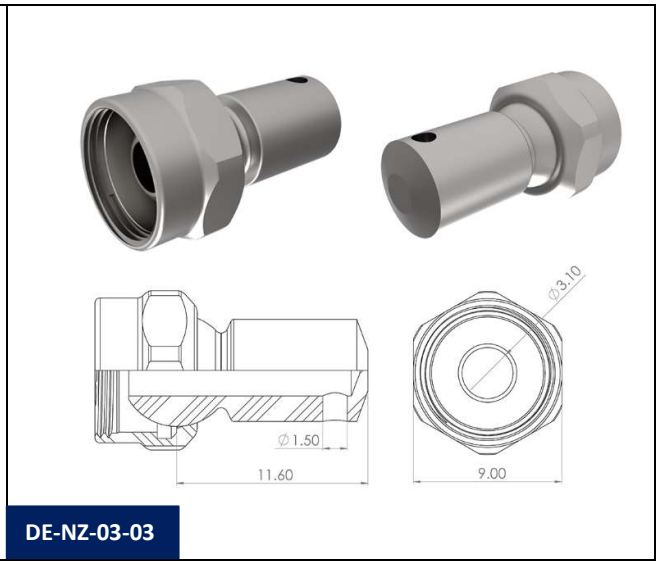
DE-NZ-03 Fig. 1 (90º simple nozzle)

Nozzle with 90º hole with different outlet diameters to meet different angled coolant delivery requirements.
Material: Steel

Ref.	Description
DE-NZ-03-02	Nozzle 90º simple ID:3 mm & L:12 mm
DE-NZ-03-03	Nozzle 90º simple ID:1.5 mm & L:12 mm



DE-NZ-03-02

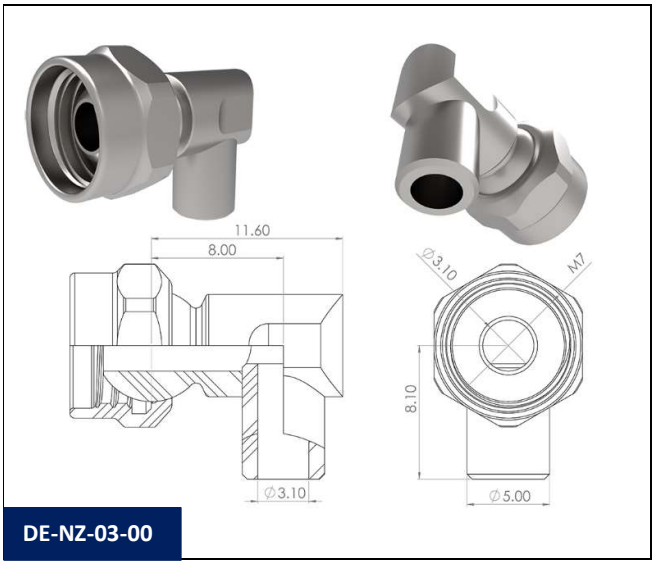


DE-NZ-03-03

DE-NZ-03 Fig. 2 (90º nozzle with tube)

Nozzle with 90º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
DE-NZ-03-00	Nozzle 90º ID:3 mm & L:15 mm

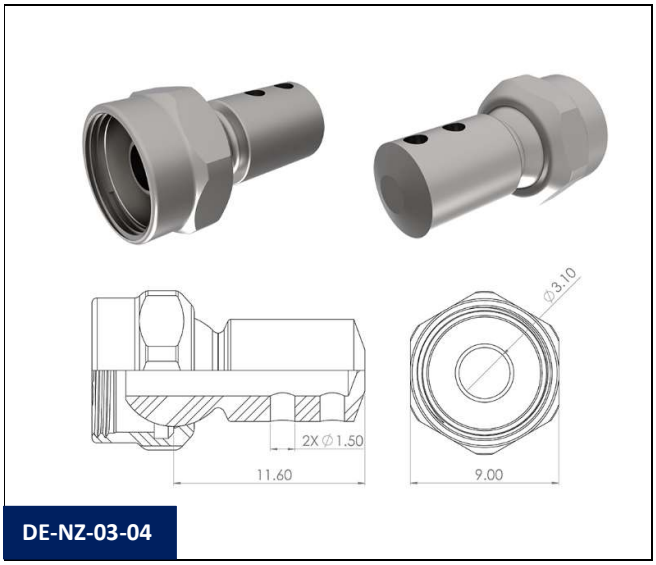


DE-NZ-03-00

DE-NZ-03 Fig. 3 (90º simple nozzle with 2 outlet holes)

Nozzle with 2 outlet holes at 90º to meet different angled coolant delivery requirements. Ideal to deliver coolant at different sections of a drill or a mill.
Material: Steel

Ref.	Description
DE-NZ-03-04	Nozzle 2 outlets at 90º simple ID:1.5 mm & L:12 mm

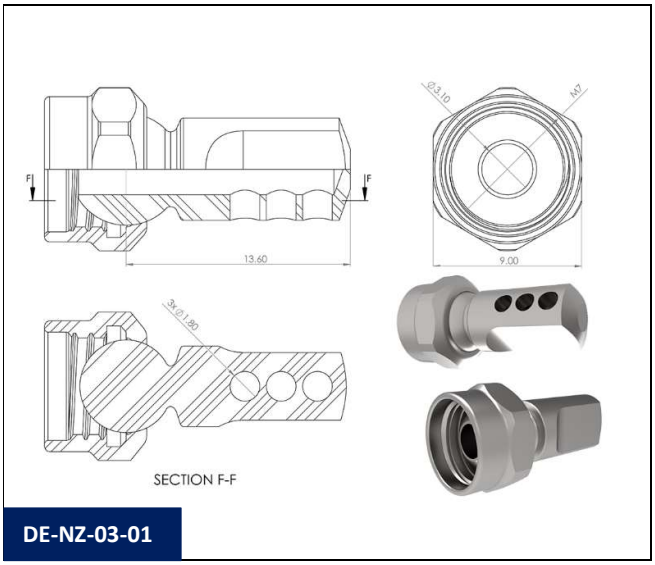


DE-NZ-03-04

DE-NZ-03 Fig. 4 (90º slim nozzle with 3 outlet holes)

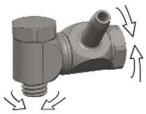
Nozzle with 3 outlet holes at 90º to meet different angled coolant delivery requirements. Ideal to deliver coolant at different sections of a drill or a mill.
Material: Steel

Ref.	Description
DE-NZ-03-01	Nozzle 3 outlets at 90º ID:1.8 mm & L:15 mm



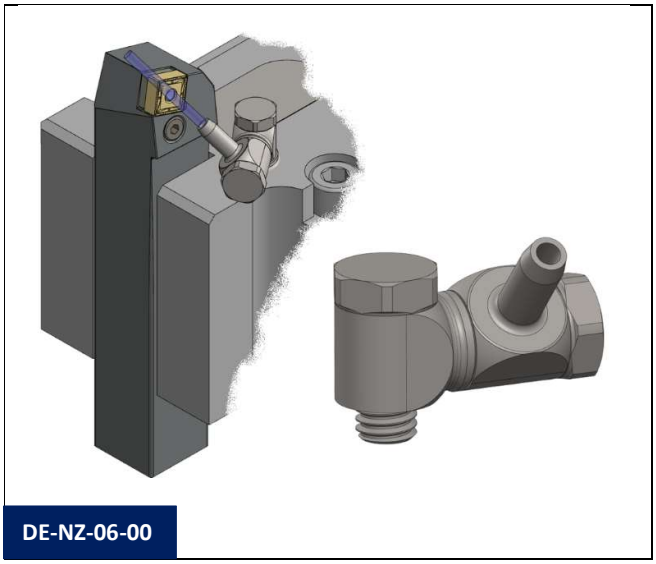
DE-NZ-03-01

DE-NZ-06 (2-axis adjustment nozzle)



Nozzle with 2-axis adjustment ideal for precise coolant delivery in tool holders.
Material: Steel

Ref.	Description
DE-NZ-06-00	Nozzle with 2-axis adjustment ID: 2 mm M6x1 & L:20 mm



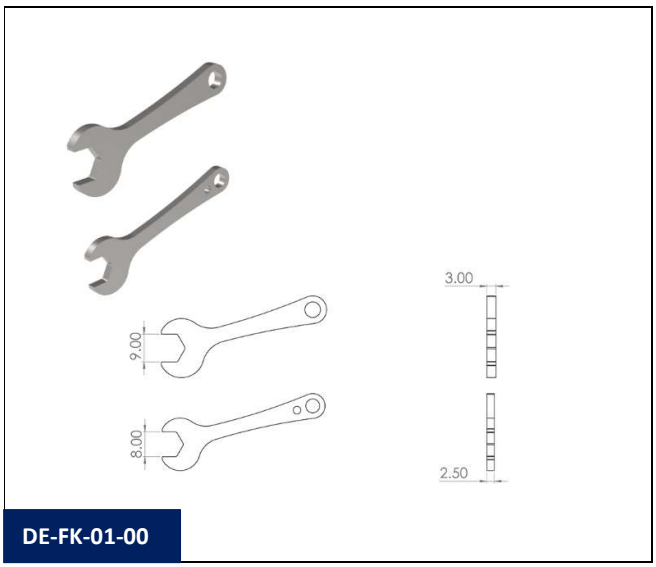
DE-NZ-06-00

FASTENING KEYS FOR DECA SYSTEM

DE-FK-01 (SW 8 and SW 9)

Special wrenches for fastening the *DECA articulated* system.
Maximum torque for locking the parts of the system: 1.8 Nm

Ref.	Description
DE-FK-01-00	Wrenches for fastening the 2 hexagons used in the DECA program. SW8 & SW9.



DE-FK-01-00

DISTRIBUTION TUBES

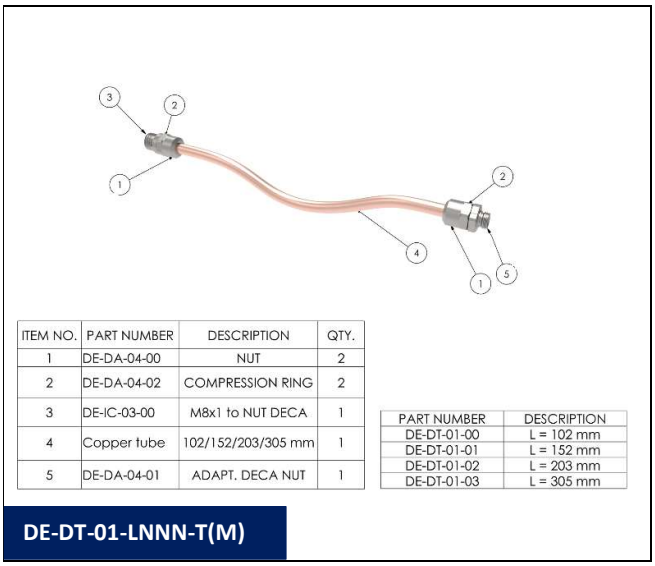
DE-DT-01 (Copper distribution tubes OD:6 mm)

Copper distribution tubes OD:6 mm, ID:4 mm prepared to connect to DECA nozzles.
On one end: M8x1(M) thread to connect to the machine-tool or tool holder.
On the other end: DECA(F) thread to connect to an DECA nozzle.
Includes:

- 1 x Copper tube OD: 6 mm with choice of different lengths.
- 1x Initial connection M8x1(M) to DECA (M) ref. DE-IC-03-00
- 2 x Nut DECA(F) ref. DE-DA-04-00
- 2 x Compression ring ref. DE-DA-04-02
- 1 x Adaptor DECA(M) to Nut ref. DE-DA-04-01

Maximum pressure: 150 Bar (2,175 psi)

Ref.	Description
DE-DT-01-L102-M8	M8x1(M) thread, nut and compression ring, copper tube OD:6 mm, ID:4 mm and L:4" (102 mm), other end with compression ring and DECA(M) thread.
DE-DT-01-L152-M8	M8x1(M) thread, nut and compression ring, copper tube OD:6 mm, ID:4 mm and L:6" (152 mm), other end with compression ring and DECA(M) thread.
DE-DT-01-L203-M8	M8x1(M) thread, nut and compression ring, copper tube OD:6 mm, ID:4 mm and L:8" (203 mm), other end with compression ring and DECA(M) thread.
DE-DT-01-L305-M8	M8x1(M) thread, nut and compression ring, copper tube OD:6 mm, ID:4 mm and L:12" (305 mm), other end with compression ring and DECA(M) thread.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DE-DA-04-00	NUT	2
2	DE-DA-04-02	COMPRESSION RING	2
3	DE-IC-03-00	M8x1 to NUT DECA	1
4	Copper tube	102/152/203/305 mm	1
5	DE-DA-04-01	ADAPT. DECA NUT	1

PART NUMBER	DESCRIPTION
DE-DT-01-00	L = 102 mm
DE-DT-01-01	L = 152 mm
DE-DT-01-02	L = 203 mm
DE-DT-01-03	L = 305 mm

DE-DT-01-LNNN-T(M)

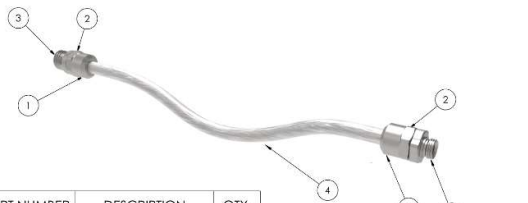
DE-DT-02 (Steel distribution tubes OD:6 mm)

Steel distribution tubes OD:6 mm, ID:4 mm prepared to connect to DECA nozzles.
On one end: M8x1(M) thread to connect to the machine-tool or tool holder.
On the other end: DECA(F) thread to connect to an DECA nozzle.
Includes:

- 1 x Steel tube OD: 8 mm with choice of different lengths.
- 1x Initial connection M8x1(M) to DECA (M) ref. DE-IC-03-00
- 2 x Nut DECA(F) ref. DE-DA-04-00
- 2 x Compression ring ref. DE-DA-04-02
- 1 x Adaptor DECA(M) to Nut ref. DE-DA-04-01

Maximum pressure: 150 Bar (2,175 psi)

Ref.	Description
DE-DT-02-L102-M8	M8x1(M) thread, nut and compression ring, steel tube OD:6 mm, ID:4 mm and L:4" (102 mm), other end with compression ring and DECA(M) thread.
DE-DT-02-L152-M8	M8x1(M) thread, nut and compression ring, steel tube OD:6 mm, ID:4 mm and L:6" (152 mm), other end with compression ring and DECA(M) thread.
DE-DT-02-L203-M8	M8x1(M) thread, nut and compression ring, steel tube OD:6 mm, ID:4 mm and L:8" (203 mm), other end with compression ring and DECA(M) thread.
DE-DT-02-L305-M8	M8x1(M) thread, nut and compression ring, steel tube OD:6 mm, ID:4 mm and L:12" (305 mm), other end with compression ring and DECA(M) thread.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DE-DA-04-00	NUT	2
2	DE-DA-04-02	COMPRESSION RING	2
3	DE-IC-03-00	M8x1 to NUT DECA	1
4	Steel tube	102/152/203/305 mm	1
5	DE-DA-04-01	ADAPT. DECA NUT	1

PART NUMBER	DESCRIPTION
DE-DT-02-00	L = 102 mm
DE-DT-02-01	L = 152 mm
DE-DT-02-02	L = 203 mm
DE-DT-02-03	L = 305 mm

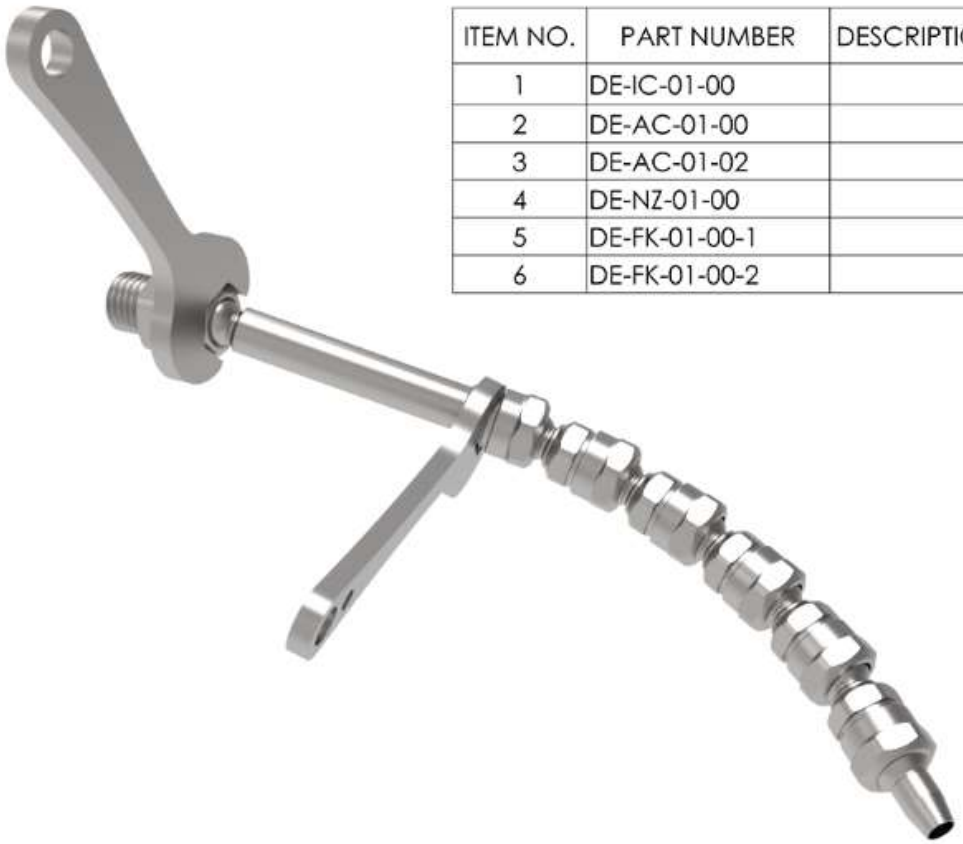
DE-DT-02-LNNN-T(M)

STARTER KITS

DE-SK-01-00 (Kit single outlet DECA)

Set of components to start and become familiar with the SCS Articulated Coolant Distribution System DECA program. Basic set of components delivered in a basic kit for the most typical applications.

Ref.	Description
DE-SK-01-00	**Kit Single Outlet DECA:** **For general cooling with a single outlet L=135 mm.** **Weight: 30 g.** ***Initial Connection:*** 1 unit DE-IC-01-00 M8x1(M) to articulated connection DECA. ***Articulated connection:*** 5 units DE-AC-01-00 Articulated connection DECA L:12.5 mm 1 unit DE-AC-01-02 Articulated connection DECA L:42.5 mm ***Coolant nozzles:*** 1 unit DE-NZ-01-00 Straight nozzle. ID:3 mm & L:9 mm ***Fastening keys for the articulated system:*** 1 unit DE-FK-01-00 Wrenches for fastening the 2 hexagons used in the DECA program. SW8 & SW9.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DE-IC-01-00		1
2	DE-AC-01-00		5
3	DE-AC-01-02		1
4	DE-NZ-01-00		1
5	DE-FK-01-00-1		1
6	DE-FK-01-00-2		1

DE-SK-01-00

HECTO (6 mm) PROGRAM

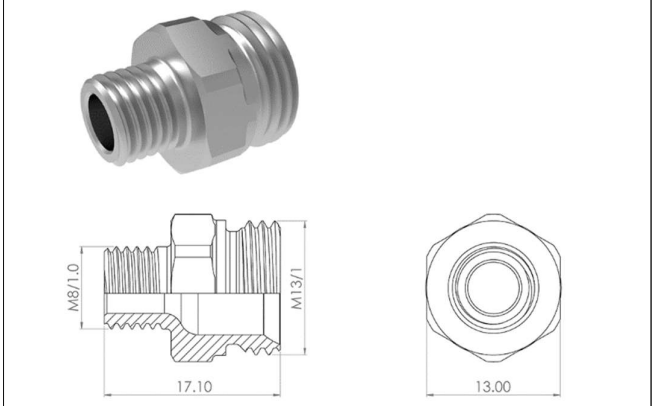
The internal through hole of the HECTO program is 6 mm and is ideal for the distribution of air and refrigerant (oil or emulsion) in small-sized machines such as Swiss-type CNC lathes, fixed-head CNC lathes, tapping centers, grinding machines or as distribution branches of bigger programs (MEGA or GIGA).
Maximum torque for locking the parts of the system: 6 Nm
Maximum pressure: 100 Bar (1,450 psi)

INITIAL CONNECTION

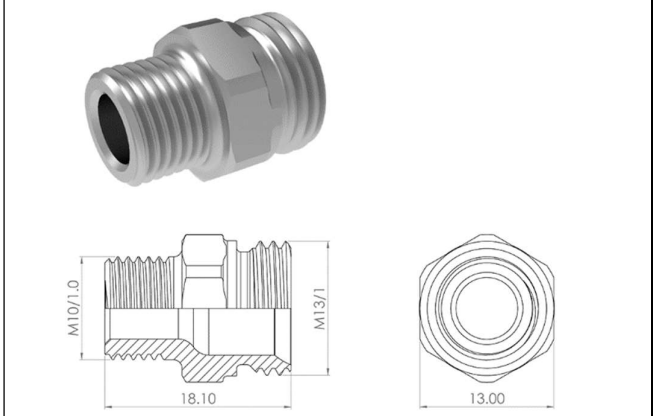
HE-IC-01 Fig. 1 (Male to HECTO)

Male thread connection elements to connect to the machine-tool or other SCS coolant distribution programs. ID:6 mm.
Material: Steel

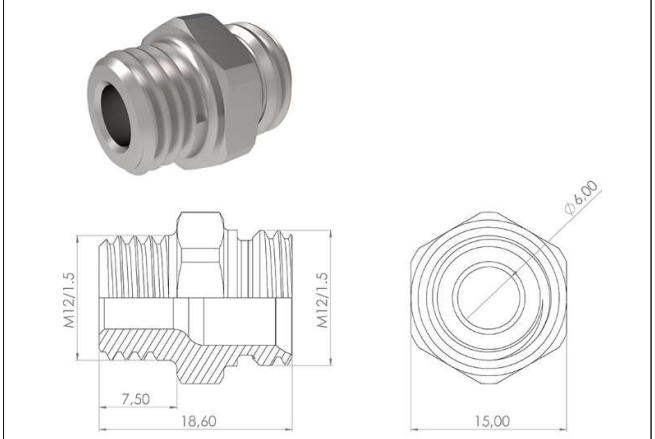
Ref.	Description
HE-IC-01-03	M8x1(M) to articulated connection HECTO.
HE-IC-01-04	M10x1(M) to articulated connection HECTO.
HE-IC-01-10	M12x1.5(M) to articulated connection HECTO.
HE-IC-01-00	BSPP 1/8"(M) to articulated connection HECTO.
HE-IC-01-02	BSPP 1/4"(M) to articulated connection HECTO.
HE-IC-01-01	BSPP 3/8"(M) to articulated connection HECTO.
HE-IC-01-11	BSPT 1/8"(M) to articulated connection HECTO.
HE-IC-01-08	BSPT 1/4"(M) to articulated connection HECTO.
HE-IC-01-12	BSPT 3/8"(M) to articulated connection HECTO.
HE-IC-01-05	NPT 1/8"(M) to articulated connection HECTO.
HE-IC-01-07	NPT 1/4"(M) to articulated connection HECTO.
HE-IC-01-06	NPT 3/8"(M) to articulated connection HECTO.



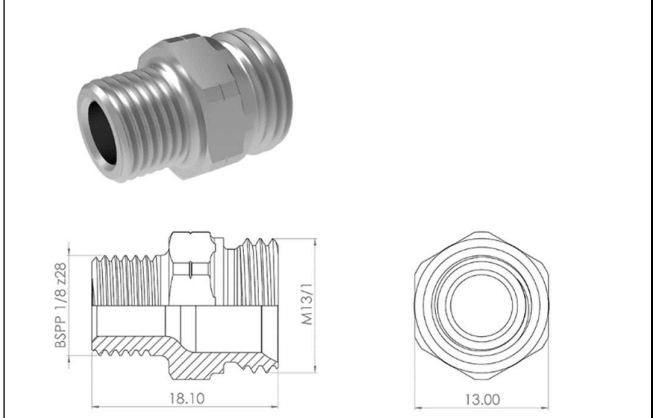
HE-IC-01-03



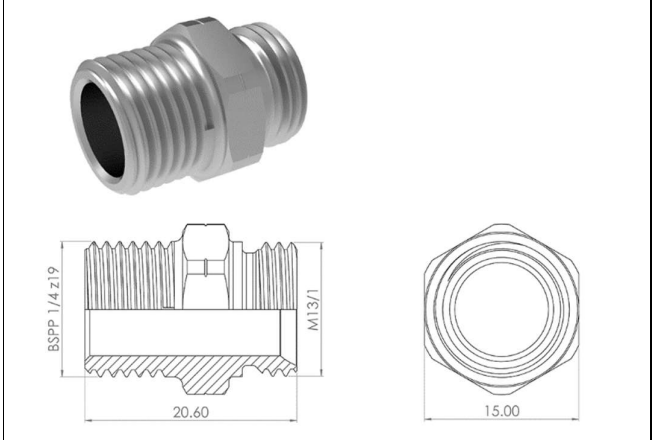
HE-IC-01-04



HE-IC-01-10



HE-IC-01-00



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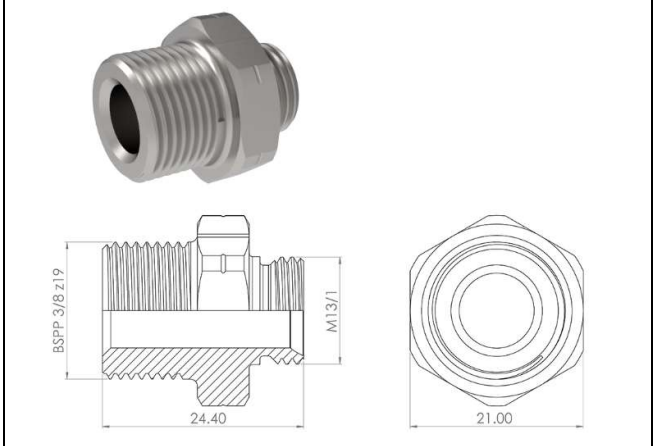
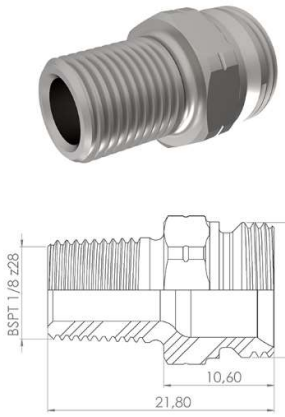
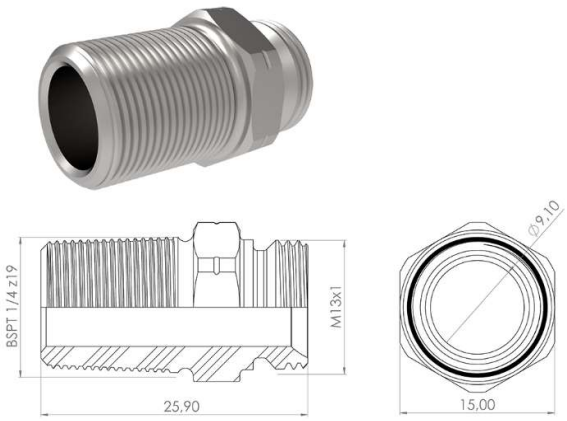


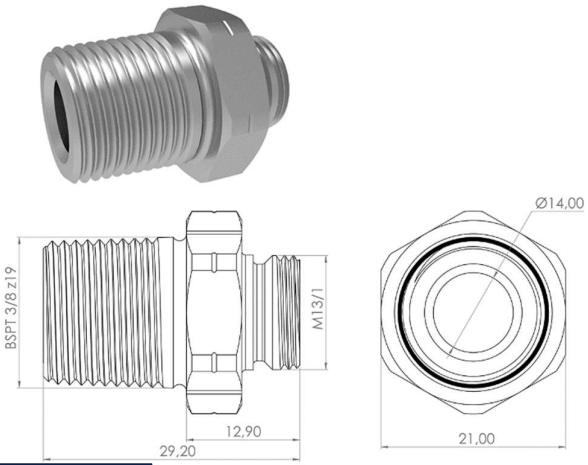
HE-IC-01-01



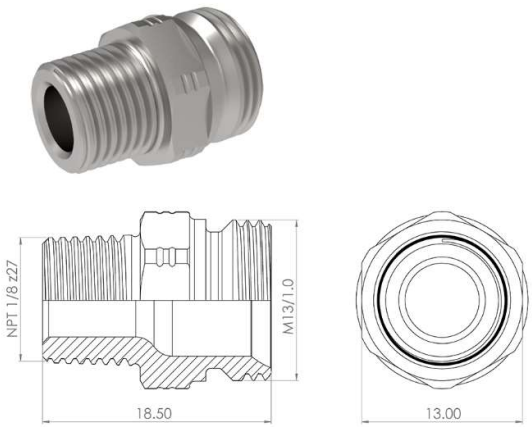
HE-IC-01-11



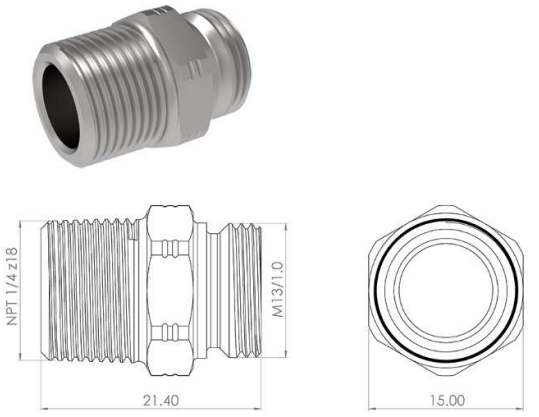
HE-IC-01-08



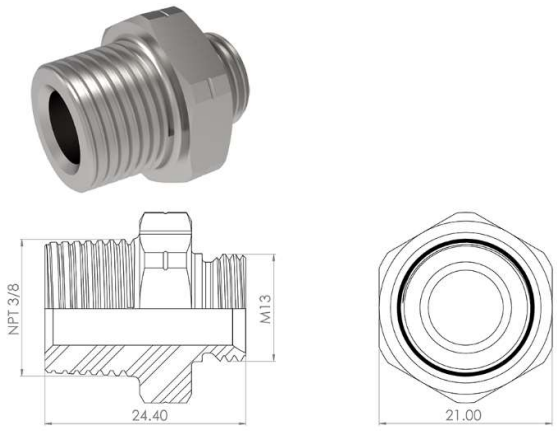
HE-IC-01-12



HE-IC-01-05



HE-IC-01-07

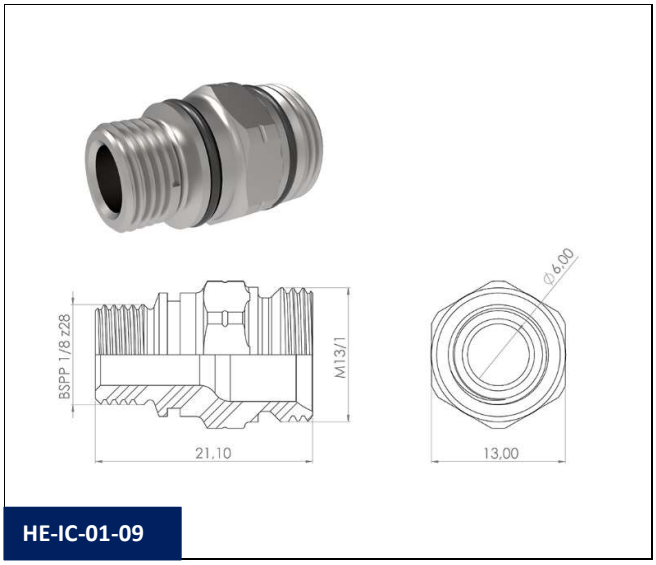


HE-IC-01-06

HE-IC-01 Fig. 2 (Male with O-ring to HECTO)

Male thread connection elements with O-ring for better liquid tightness to connect to the machine-tool or other SCS coolant distribution programs. ID:6 mm.
Material: Steel

Ref.	Description
HE-IC-01-09	BSPP 1/8"(M) with O-ring to articulated connection HECTO.

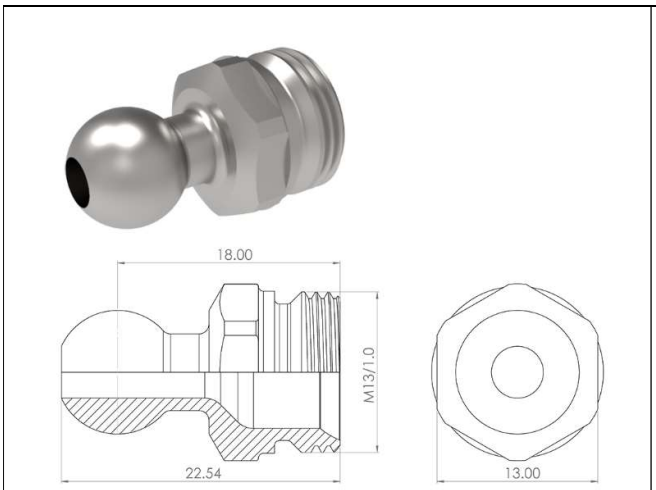


HE-IC-01-09

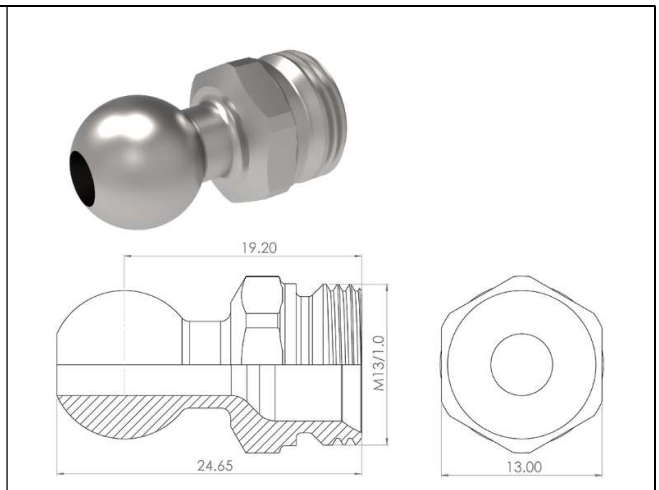
HE-IC-02 (Ball to HECTO)

Ball connection elements to tool holders. ID:3 mm.
Material: Steel

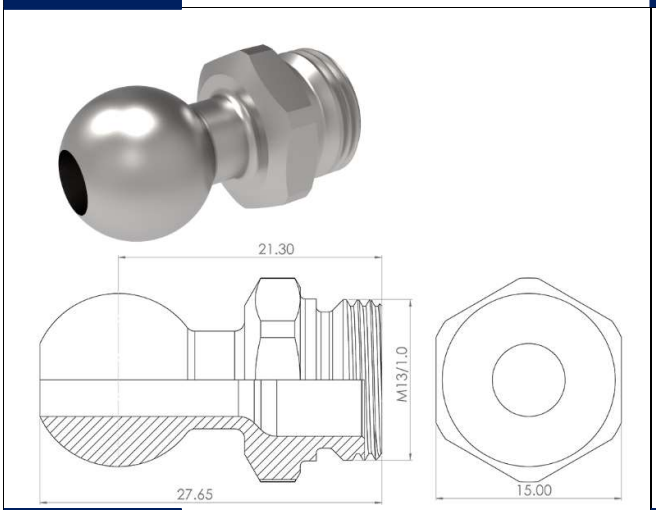
Ref.	Description
HE-IC-02-00	Ball OD:10 mm to articulated connection HECTO.
HE-IC-02-01	Ball OD:12 mm to articulated connection HECTO.
HE-IC-02-02	Ball OD:14 mm to articulated connection HECTO.
HE-IC-02-03	Ball OD:15 mm to articulated connection HECTO.



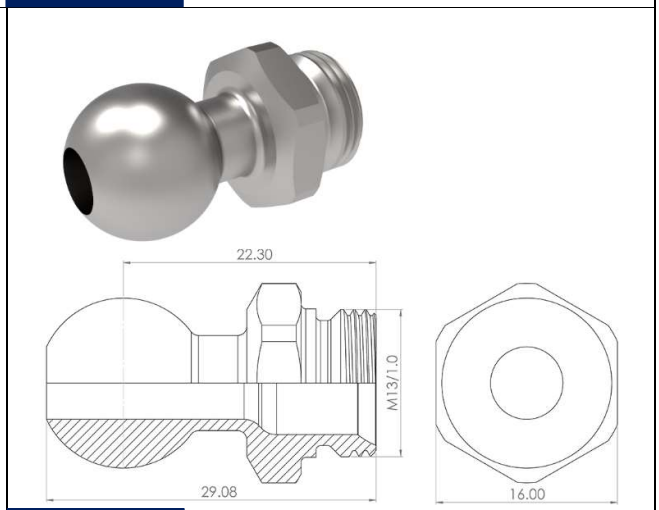
HE-IC-02-00



HE-IC-02-01



HE-IC-02-02

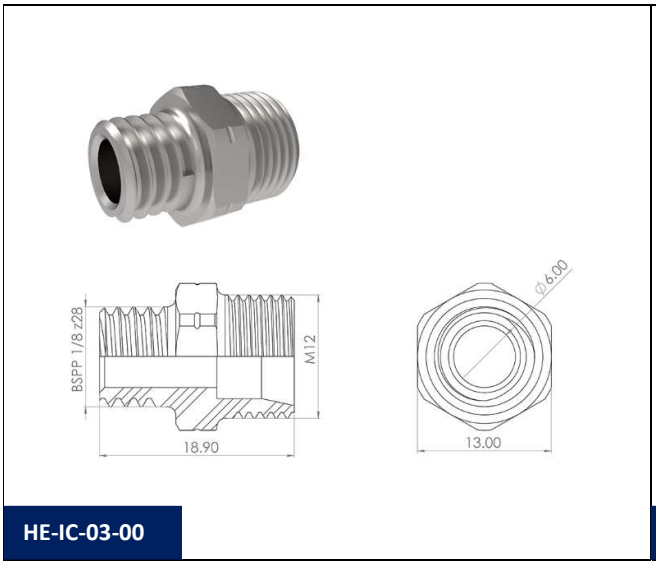


HE-IC-02-03

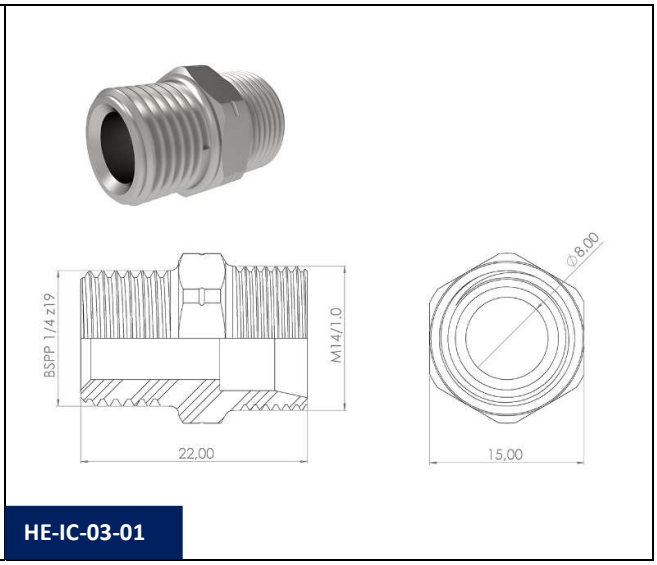
HE-IC-03 (Male to Nut for compression ring)

Male thread connection elements to integrate a Compression ring (HE-DA-04/05 Fig. 3) and together with a Nut HECTO (HE-DA-04/05 Fig. 2) clamp a copper or steel tube. ID:6 mm. To connect to the machine-tool or tool holder.
Material: Steel

Ref.	Description
HE-IC-03-00	BSPP 1/8"(M) to Nut for compression ring ID:8 mm HECTO.
HE-IC-03-01	BSPP 1/4"(M) to Nut for compression ring ID:10 mm HECTO



HE-IC-03-00



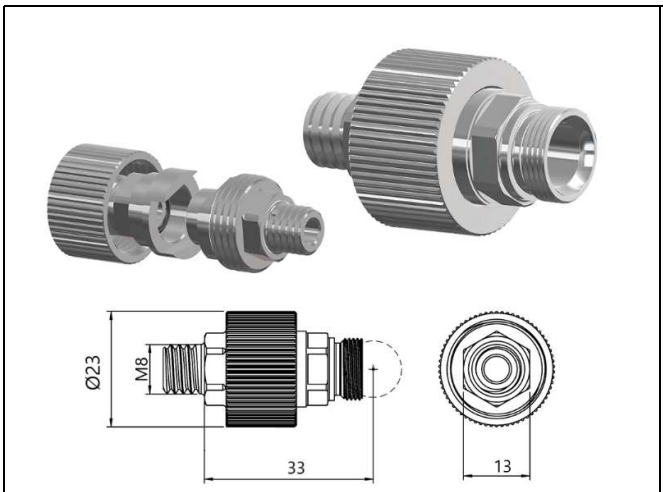
HE-IC-03-01

QUICK POSSITIONED CONNECTIONS

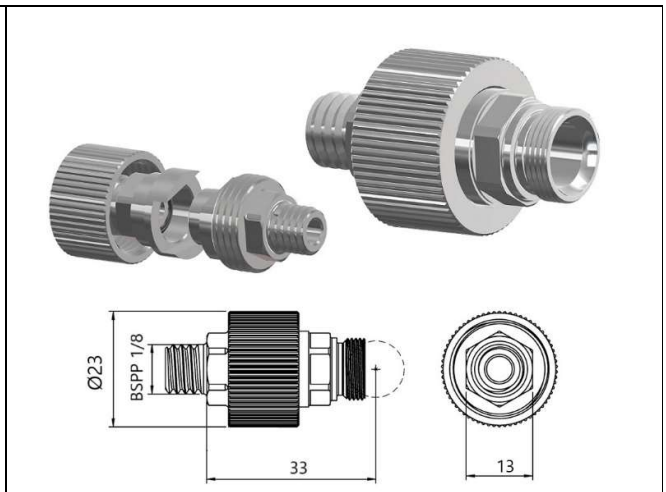
HE-QP-01 (Male to HECTO)

Positioned quick connection to substitute initial connection HE-IC-01 Fig 1. ID:6 mm.
Material: Steel

Ref.	Description
HE-QP-01-01	Quick connection positioned M8x1(M) to articulated connection HECTO.
HE-QP-01-00	Quick connection positioned BSPP1/8"(M) to articulated connection HECTO.



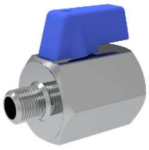
HE-QP-01-01



HE-QP-01-00

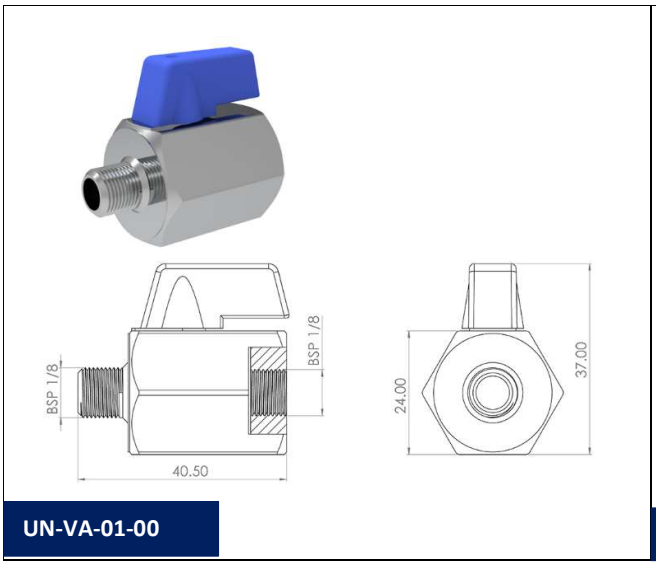
BALL VALVES

UN-VA-01 (PN10 – Male to Female)

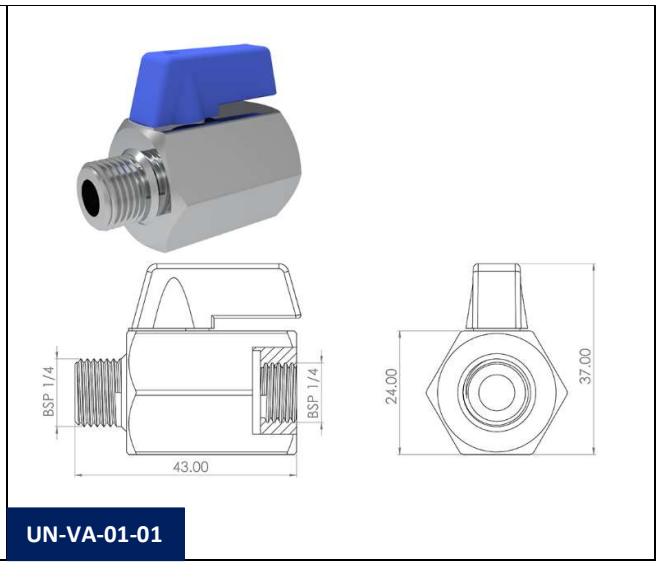


Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 10 bar (145 psi).
Material: Chrome plated brass.

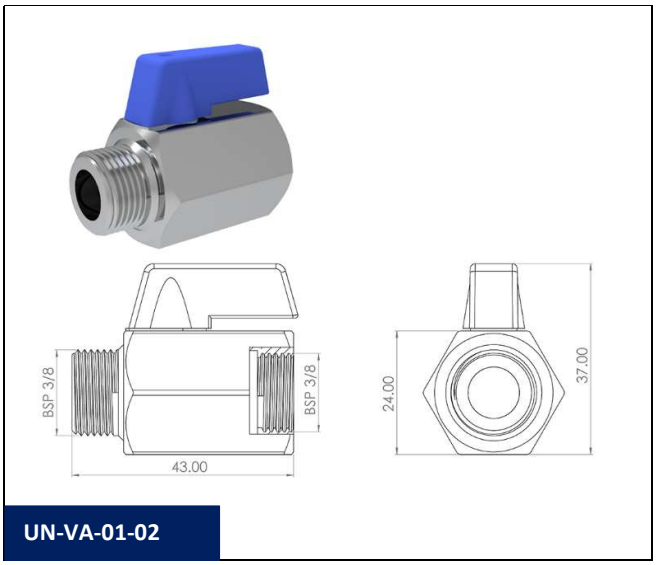
Ref.	Description
UN-VA-01-00	Closing valve PN10, BSPP 1/8"(M) and BSPP 1/8"(F) chromed-plated brass.
UN-VA-01-01	Closing valve PN10, BSPP 1/4"(M) and BSPP 1/4"(F) chromed-plated brass.
UN-VA-01-02	Closing valve PN10, BSPP 3/8"(M) and BSPP 3/8"(F) chromed-plated brass.



UN-VA-01-00



UN-VA-01-01

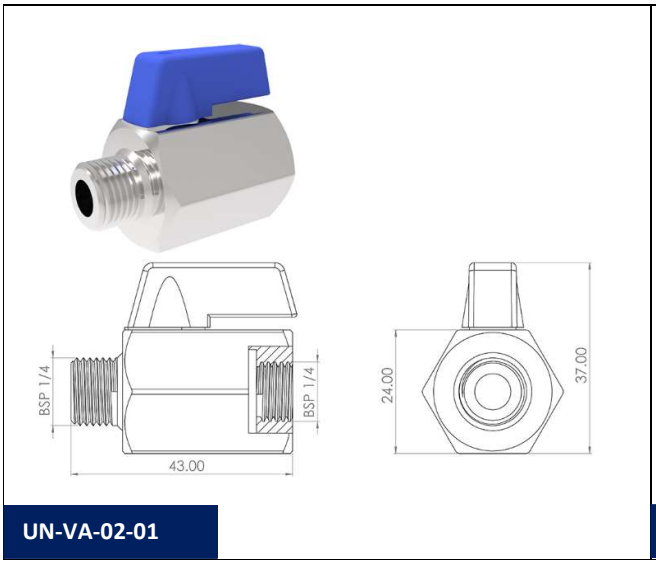


UN-VA-01-02

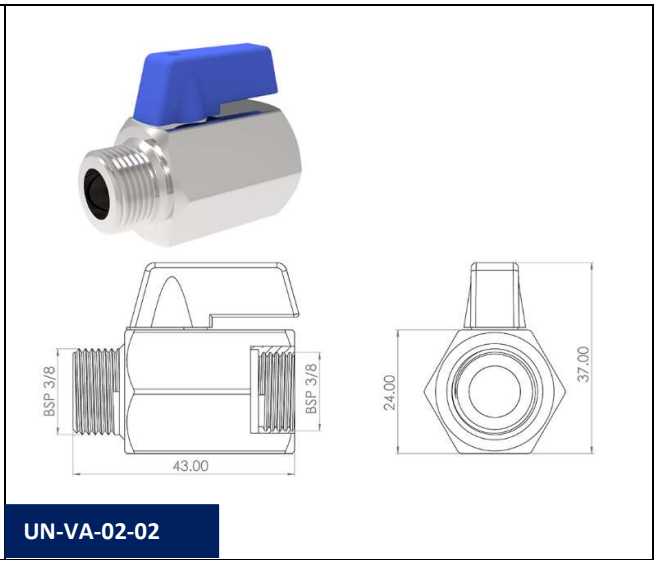
UN-VA-02 (PN63 – Male to Female)

Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 63 bar (914 psi).
Material: Stainless steel AISI-316

Ref.	Description
UN-VA-02-01	Closing valve PN63, BSPP 1/4"(M) and BSPP 1/4"(F) AISI-316
UN-VA-02-02	Closing valve PN63, BSPP 3/8"(M) and BSPP 3/8"(F) AISI-316



UN-VA-02-01



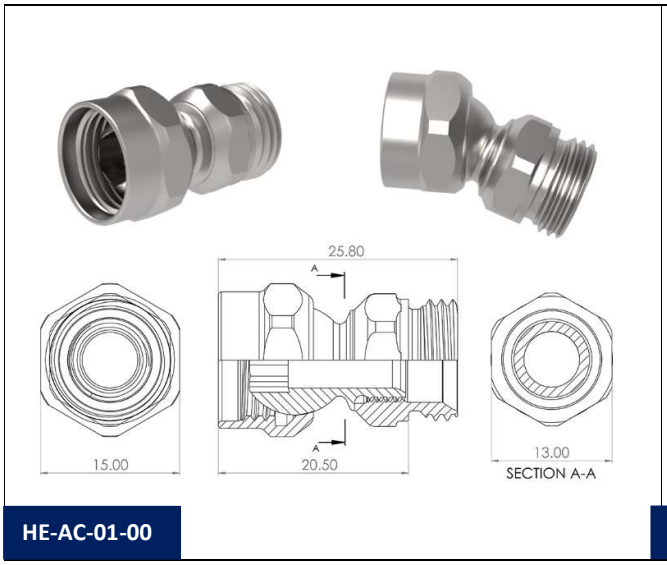
UN-VA-02-02

ARTICULATED CONNECTIONS

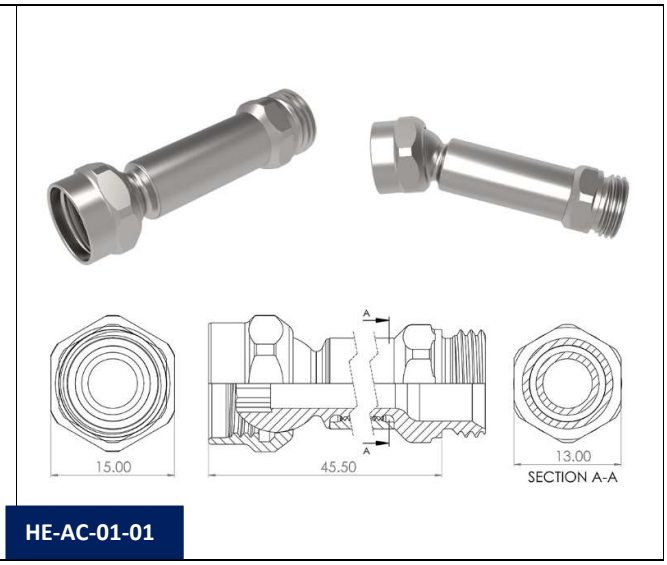
HE-AC-01 (Straight connection)

Basic straight articulated elements which connect to an initial connection, to another articulated connection, to a quick positioned connection or to a nozzle. Swiveling ±25º. ID:6 mm.
Material: Steel

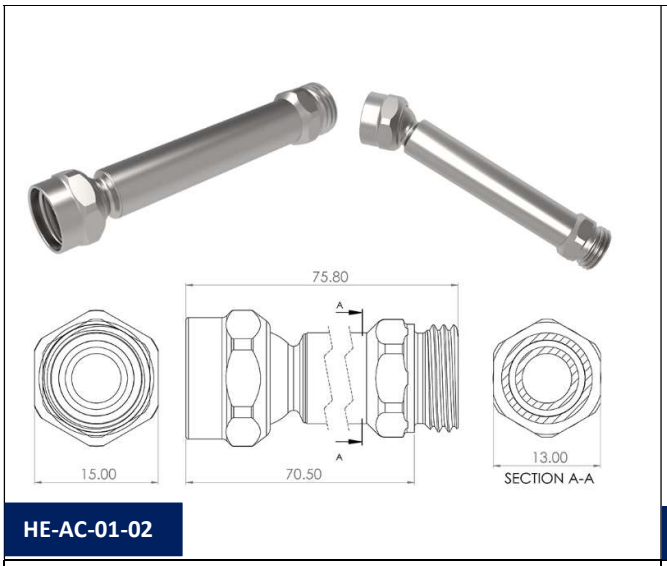
Ref.	Description
HE-AC-01-00	Articulated connection HECTO L:20.5 mm
HE-AC-01-01	Articulated connection HECTO L:45.5 mm
HE-AC-01-02	Articulated connection HECTO L:70.5 mm
HE-AC-01-03	Articulated connection HECTO L:95.5 mm
HE-AC-01-04	Articulated connection HECTO L:120.5 mm



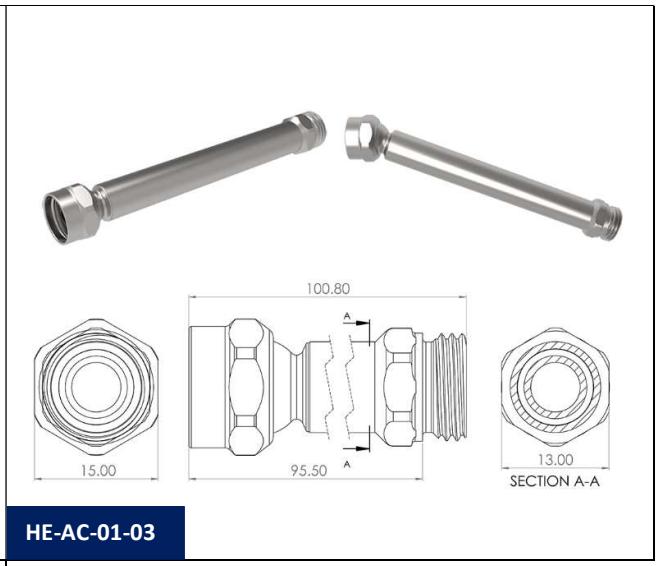
HE-AC-01-00



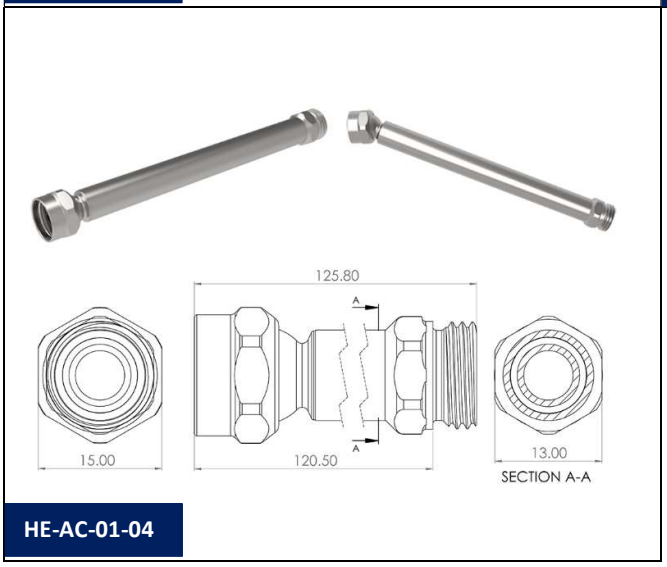
HE-AC-01-01



HE-AC-01-02



HE-AC-01-03

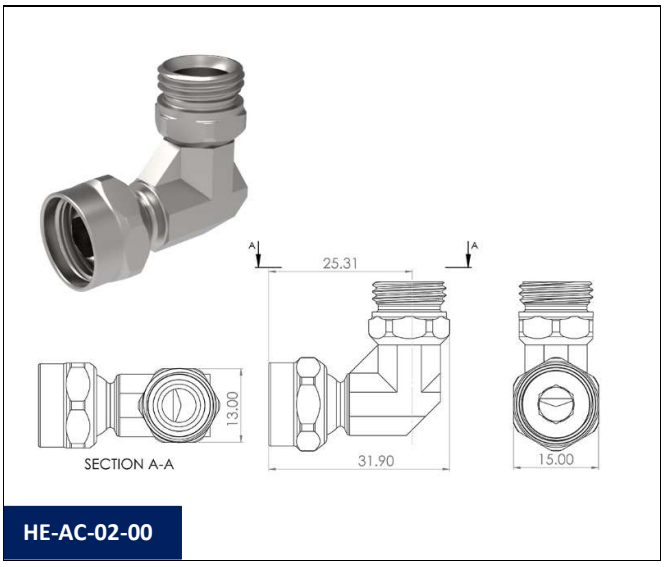


HE-AC-01-04

HE-AC-02 (90º connection)

90º articulated elements which connect to an initial connection, to a straight connection, to a quick positioned connection or to a nozzle. Swiveling ±25º. ID:6 mm.
Material: Steel

Ref.	Description
HE-AC-02-00	Articulated connection to 90º HECTO



HE-AC-02-00

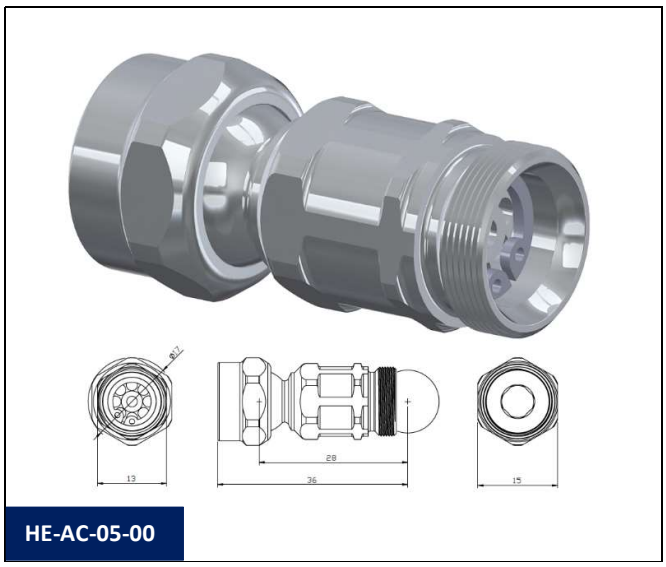
HE-AC-05 (Straight connection with non-return valve)

Straight articulation with non-return valve which connects to an initial connection, to an articulated connection, to a quick positioned connection or to a nozzle. Ideal for general machining applications or grinding. It allows to avoid:

- Any time delay between activation of the coolant pump and delivery of coolant because the line remains full of coolant.
- Dripping of coolant when the cooling pump is stopped, thus avoiding situation in which coolant falls on the machine operator when setting or inspecting the work part.

Swiveling ±25º. ID:6 mm.
Minimum opening pressure: 0.1 Bar
Material: Steel

Ref.	Description
HE-AC-05-00	Articulated connection HECTO with non-return valve L:28.8 mm



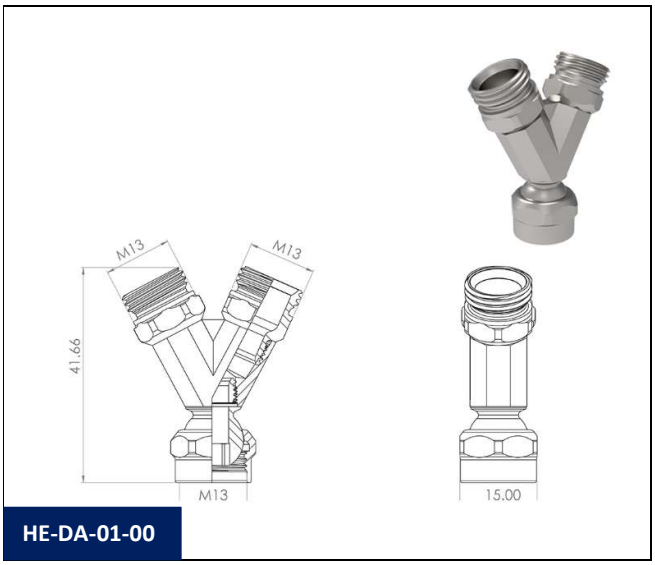
HE-AC-05-00

DISTRIBUTORS, BANJOS+BANJO BOLTS, ADAPTORS, NUTS AND COMPRESSION RINGS

HE-DA-01 (60º Split distributor)

Coolant split distributor 60º (“Y” type). Expansion of articulated lines and adaption to other SCS coolant distribution systems.
Material: Steel

Ref.	Description
HE-DA-01-00	“Y” distributor to articulated connection HECTO

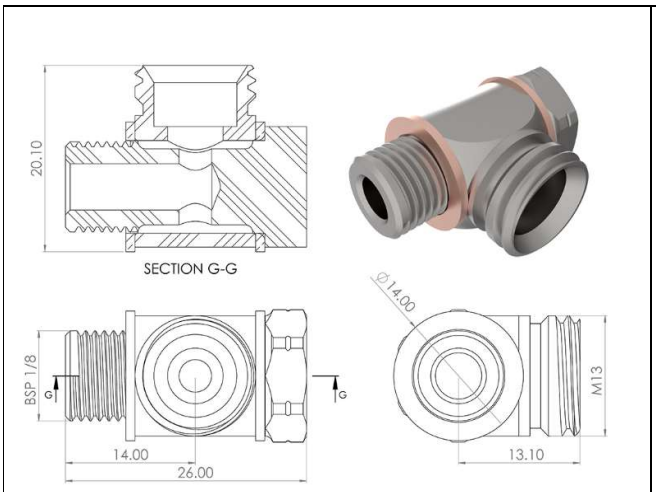


HE-DA-01-00

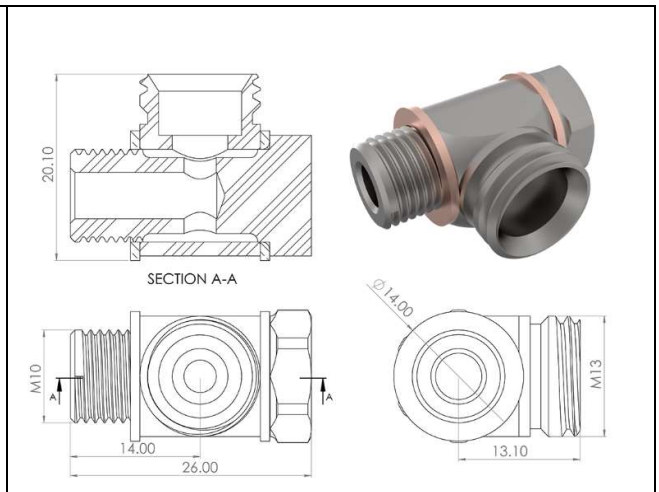
HE-DA-02 (Short banjo HECTO + Banjo bolt)

Short banjo to connect directly to the machine-tool (i.e. CNC lathe turret) with HECTO outlet which can be attached to HECTO articulated steel tubes or nozzles. Adaptors or spacers from the MICRO and NANO or UNIVERSAL families can be used.
Material: Steel

Ref.	Description
HE-DA-02-00	Short banjo HECTO connection with banjo bolt BSPP 1/8"(M) and sealing gaskets in copper
HE-DA-02-02	Short banjo HECTO connection with banjo bolt M10x1(M) and sealing gaskets in copper



HE-DA-02-00

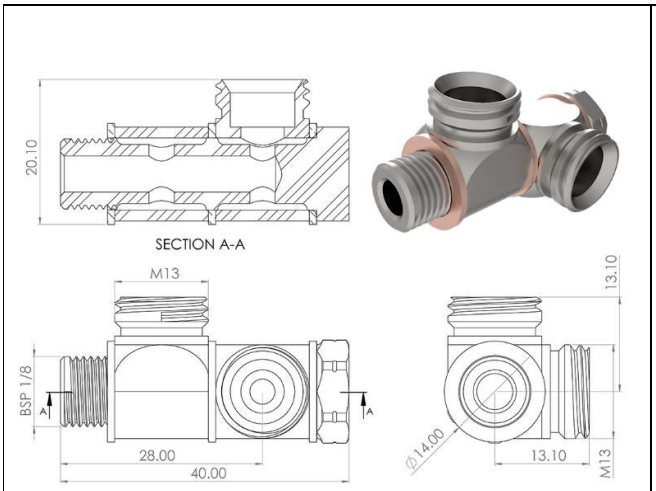


HE-DA-02-02

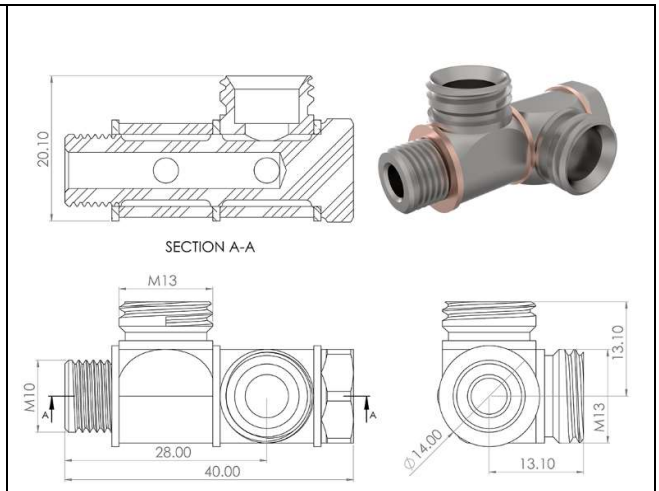
HE-DA-02 (Two short banjos HECTO + Banjo bolt)

Two short banjos to connect directly to the machine-tool creating a coolant distributor with HECTO outlet which can be attached to HECTO articulated steel tubes or nozzles. Adaptors or spacers from the MICRO and NANO or UNIVERSAL families can be used to connect to the machine-tool.
Material: Steel

Ref.	Description
HE-DA-02-01	Two short banjos HECTO connection with long banjo bolt BSPP 1/8"(M) and sealing gaskets in copper
HE-DA-02-03	Two short banjos HECTO connection with long banjo bolt M10x1(M) and sealing gaskets in copper



HE-DA-02-01

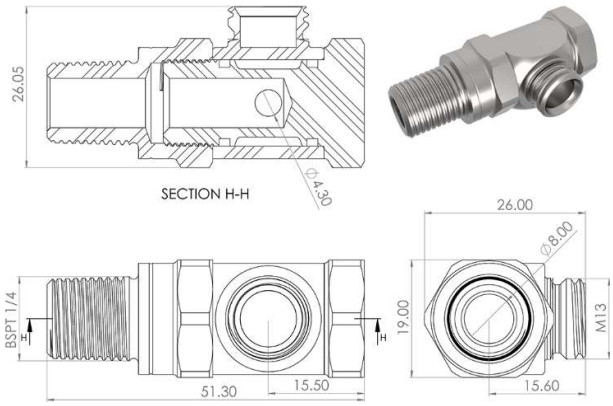


HE-DA-02-03

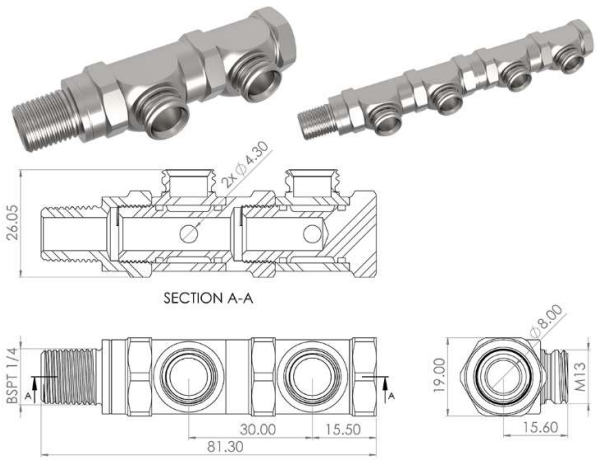
HE-DA-03 (Expandable distributor with 90º outlet HECTO)

Banjos with 90º outlet HECTO to connect directly to the machine-tool that can be expanded without limitation in the number of parts to create a distributor. HECTO articulated steel tubes or nozzles can be connected to these parts. Adaptors from the UNIVERSAL family can be used to connect to threads different than the references indicated below.
Material: Steel

Ref.	Description
HE-DA-03-00	Distributor with 90º outlet. Includes connection to machine BSPT 1/4", short banjo HECTO connection and banjo bolt. Expandable using HE-DA-03-01.
HE-DA-03-01	Additional outlet for distributor HE-DA-03-00. Includes short banjo HECTO connection and banjo bolt for expansion. No limit for expansion.



HE-DA-03-00

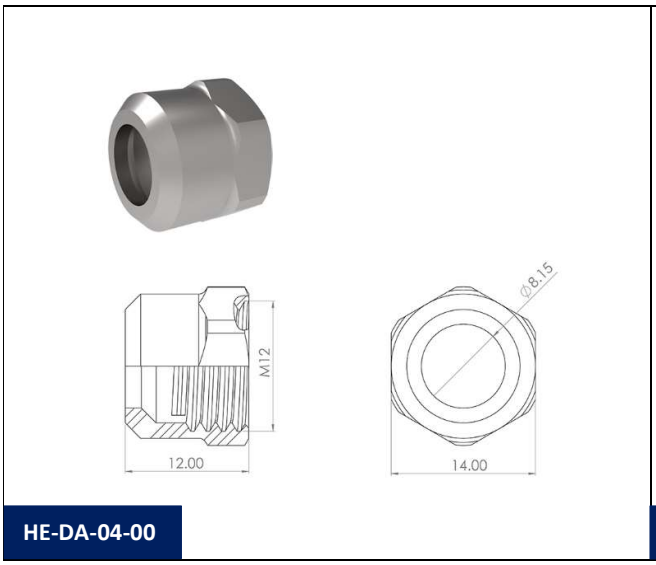


HE-DA-03-01

HE-DA-04/05 Fig. 1 (Nut)

Nut HECTO to clamp a copper or steel tube together with a Compression ring (HE-DA-04/05 Fig. 3) and Adaptor HECTO to Nut (DE-DA-04/05 Fig. 2)
Material: Steel

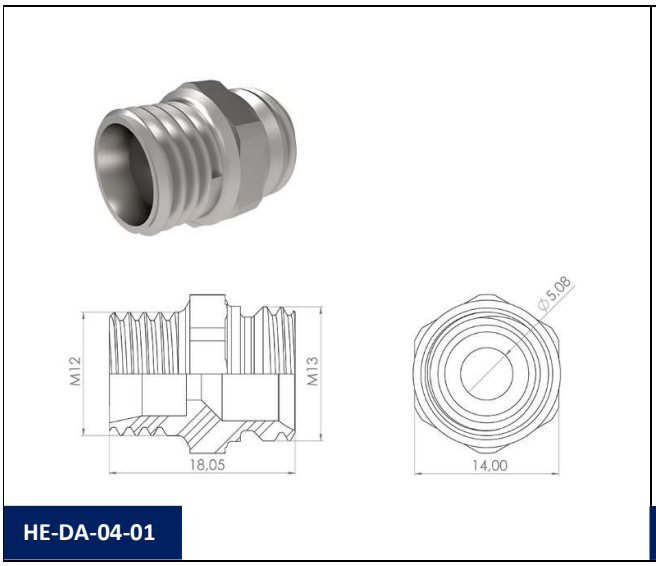
Ref.	Description
HE-DA-04-00	Nut HECTO(F) for compression ring ID:8 mm
HE-DA-05-00	Nut HECTO(F) for compression ring ID:10 mm



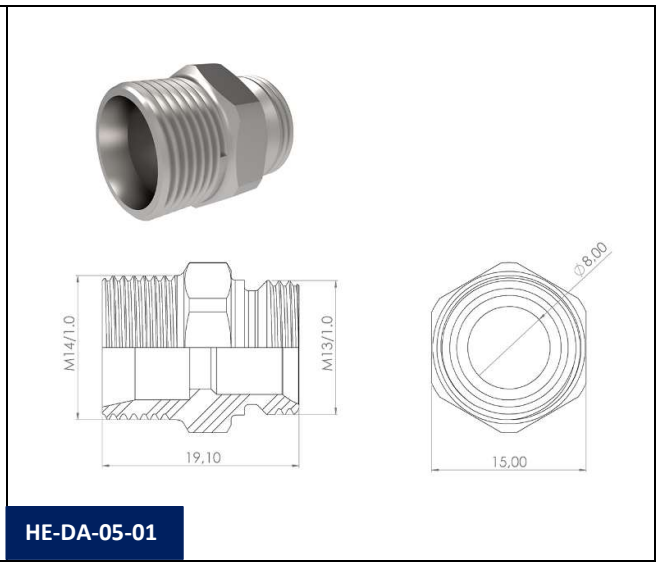
HE-DA-04/05 Fig. 2 (Adaptor HECTO to Nut)

Adaptor HECTO to Nut to clamp a copper or steel tube together with a Nut HECTO and Compression ring (HE-DA-04/05 Fig. 3). To connect to other Articulated connections (HE-AC-01 or HE-AC-02), to Distributors (HE-DA-01) or to Adaptor HECTO(F) to HECTO(F) for connecting directly to the whole range of Initial connections (HE-IC-01 or HE-IC-02).
Material: Steel

Ref.	Description
HE-DA-04-01	Adaptor HECTO(M) to Nut for compression ring ID:8 mm
HE-DA-05-01	Adaptor HECTO(M) to Nut for compression ring ID:10 mm



HE-DA-04-01

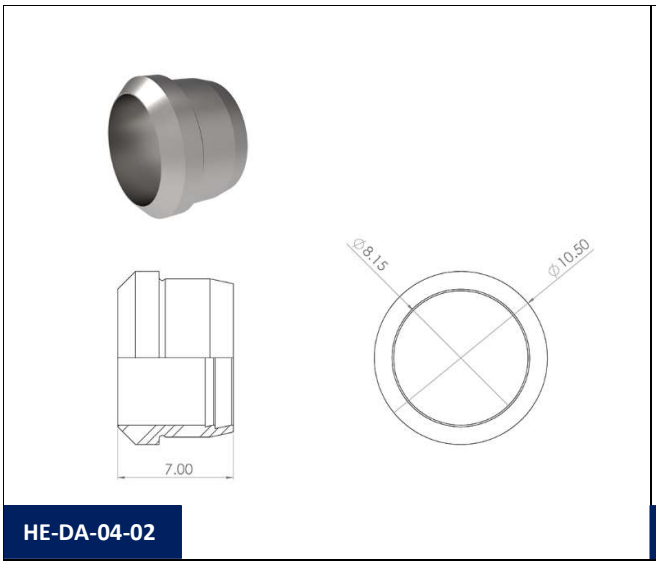


HE-DA-05-01

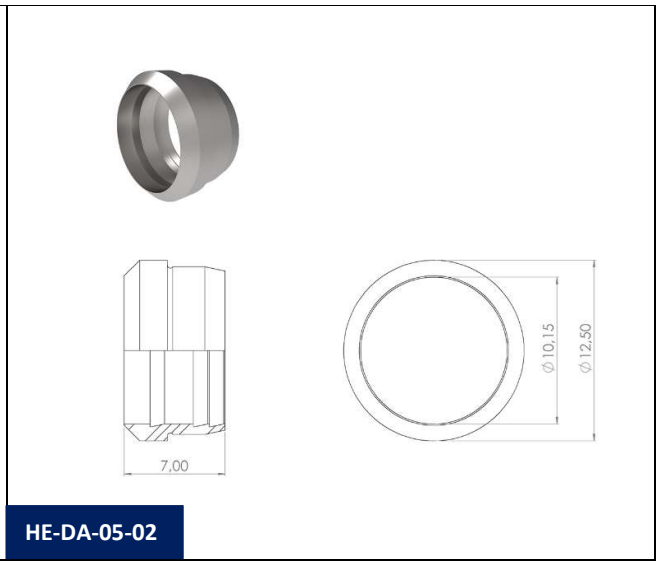
HE-DA-04/05 Fig. 3 (Compression ring)

Compression ring to clamp a copper or steel tube together with a Nut HECTO (HE-DA-04/05 Fig.1) and Adaptor HECTO to Nut (HE-DA-04/05 Fig. 2)
Material: Steel

Ref.	Description
HE-DA-04-02	Compression ring ID:8 mm. HECTO
HE-DA-05-02	Compression ring ID:10 mm. HECTO



HE-DA-04-02

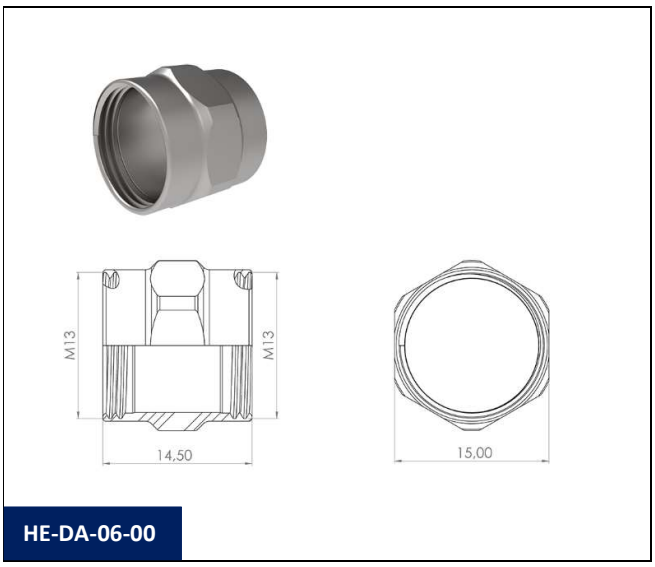


HE-DA-05-02

HE-DA-06 (Adaptor HECTO(F) to HECTO(F))

Adaptor HECTO(F) to HECTO(F) for reverse assembly of the system. For mounting the Adaptors HECTO to Nut (HE-DA-04/05 Fig 2) and then connect them to the whole range of Initial connections (HE-IC-01 or HE-IC-02). Also useful for some other specific cases.
Material: Steel

Ref.	Description
HE-DA-06-00	Adaptor HECTO(F) to HECTO(F) to reverse the mounting of the system.



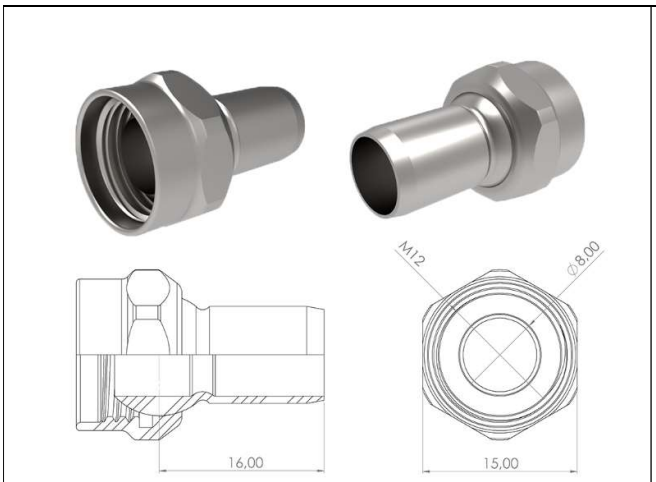
HE-DA-06-00

NOZZLES – GENERAL APPLICATIONS

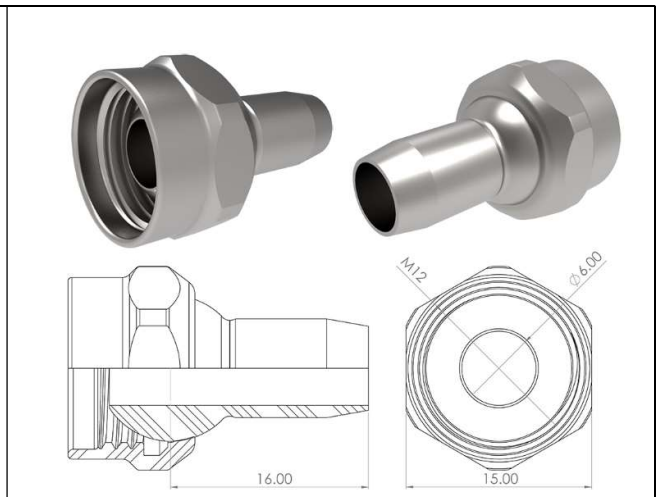
HE-NZ-01 Fig. 1 (Straight short nozzle)

Straight short nozzles with different outlet diameters to meet different coolant delivery requirements.
Material: Steel

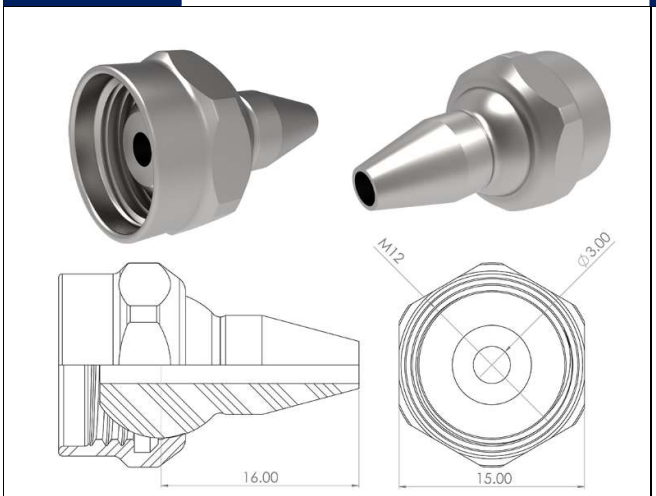
Ref.	Description
HE-NZ-01-09	Straight nozzle. ID:8 mm & L:16 mm
HE-NZ-01-00	Straight nozzle. ID:6 mm & L:16 mm
HE-NZ-01-01	Straight nozzle. ID:3 mm & L:16 mm
HE-NZ-01-02	Straight nozzle. ID:2 mm & L:16 mm
HE-NZ-01-08	Straight nozzle. ID:1 mm & L:16 mm



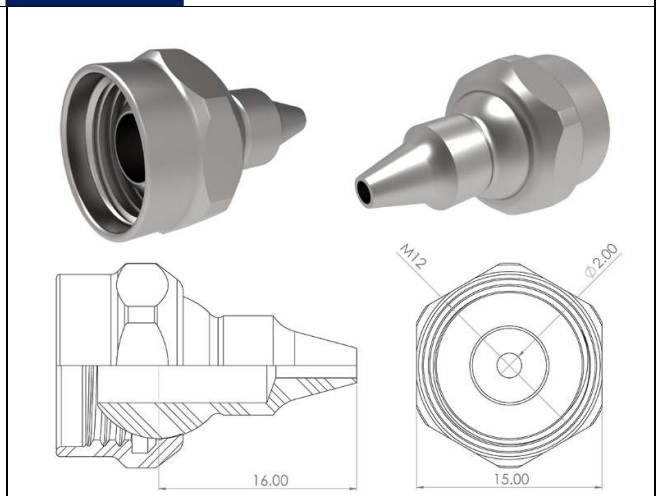
HE-NZ-01-09



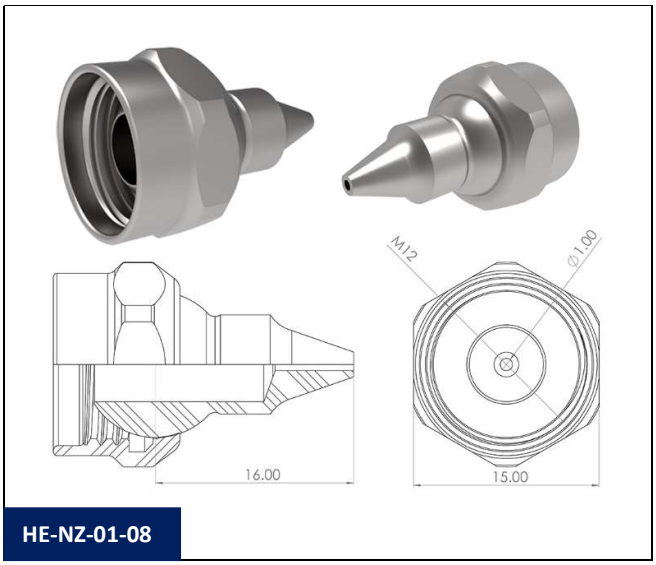
HE-NZ-01-00



HE-NZ-01-01



HE-NZ-01-02

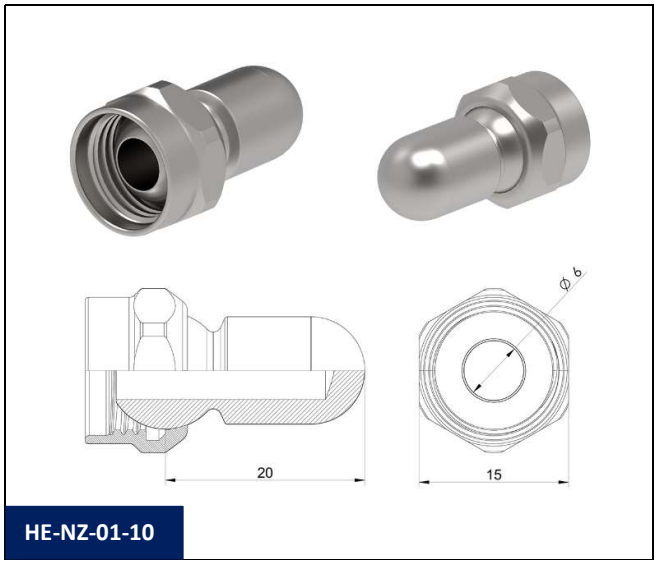


HE-NZ-01-08

HE-NZ-01 Fig. 2 (Blind short nozzle)

Short nozzle prepared to be drilled by the end-user to the required outlet diameter
Material: Steel

Ref.	Description
HE-NZ-01-10	Straight nozzle. ID:0 mm & L:20 mm

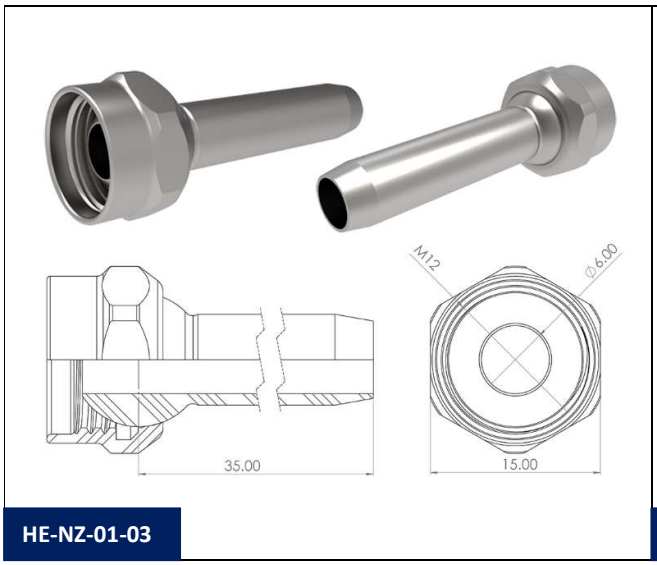


HE-NZ-01-10

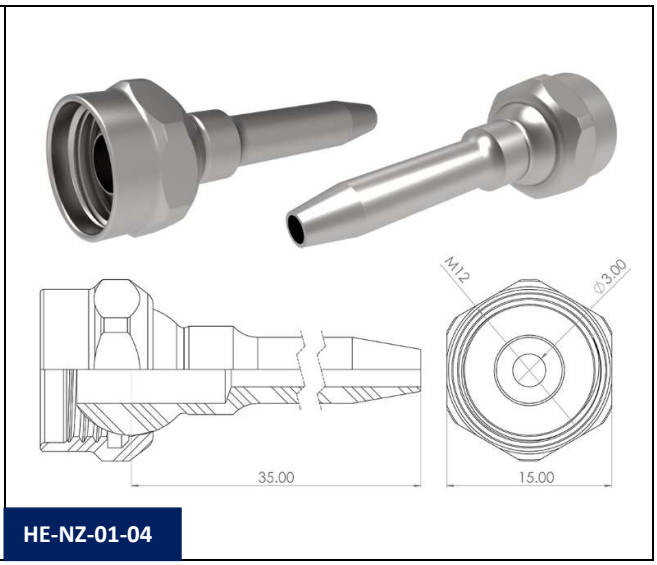
HE-NZ-01 Fig. 3 (Straight long nozzle)

Straight long nozzles with different outlet diameters to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-01-03	Straight nozzle. ID:6 mm & L:35 mm
HE-NZ-01-04	Straight nozzle. ID:3 mm & L:35 mm



HE-NZ-01-03

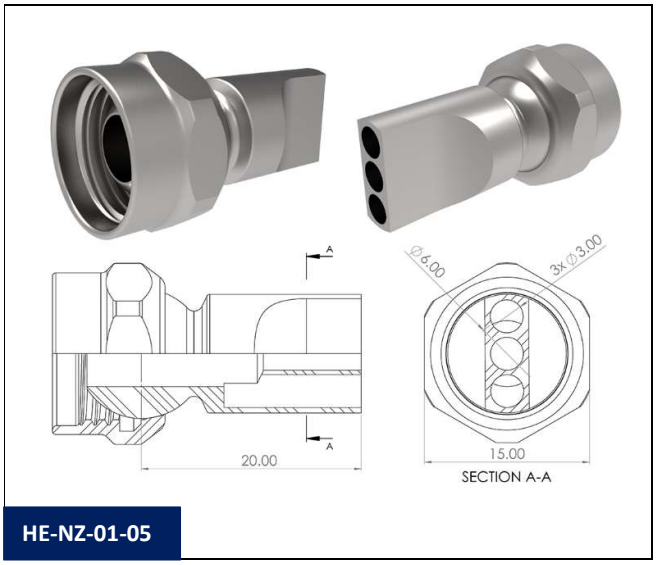


HE-NZ-01-04

HE-NZ-01 Fig. 4 (Straight nozzle multiple linear outlet)

Straight nozzles with multiple outlet holes to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-01-05	Straight nozzle. ID:3 mm x 3 & L:20 mm

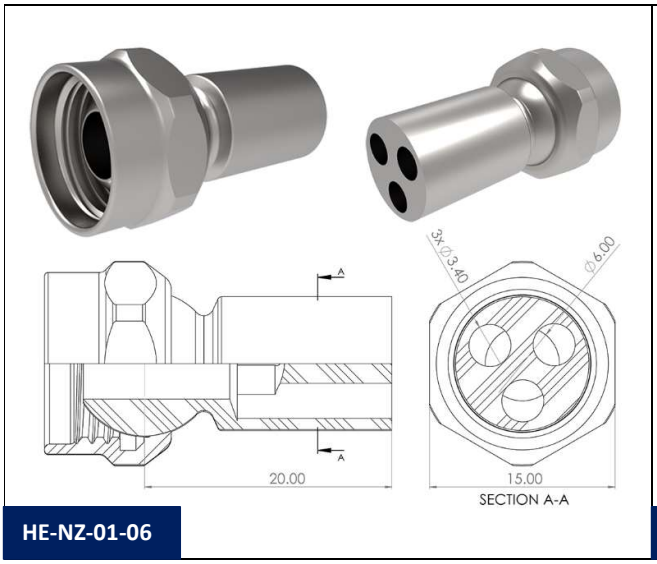


HE-NZ-01-05

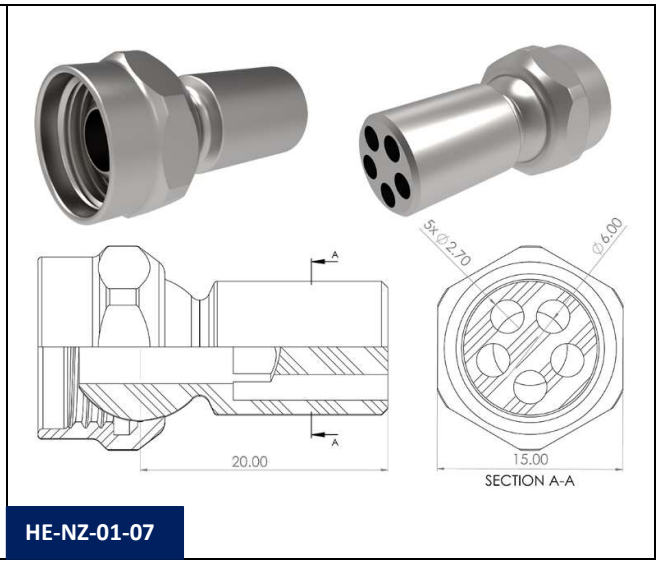
HE-NZ-01 Fig. 5 (Straight nozzle coaxial outlet)

Straight coaxial nozzles with multiple outlet holes to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-01-06	Straight nozzle coaxial. ID:3.4 x 3 & L=20 mm
HE-NZ-01-07	Straight nozzle coaxial. ID:2.7 x 5 & L=20 mm



HE-NZ-01-06

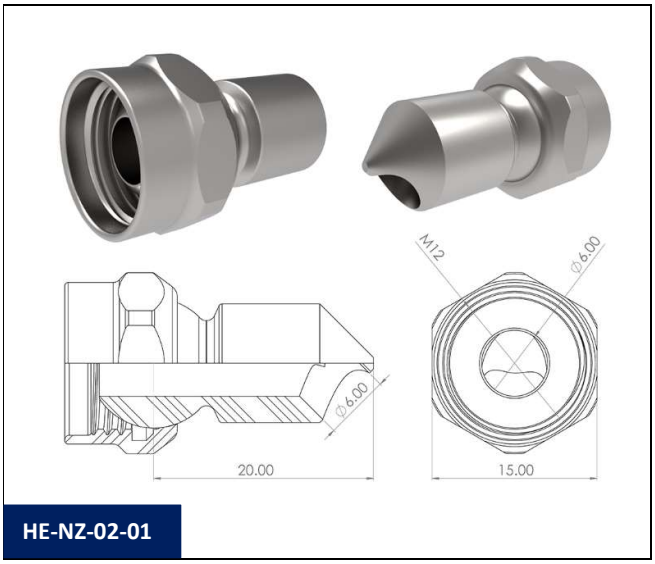


HE-NZ-01-07

HE-NZ-02 Fig. 1 (45º simple nozzle)

Nozzle with 45º hole outlet for angled coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-02-01	Nozzle 45º simple. ID:6 mm & L:20 mm

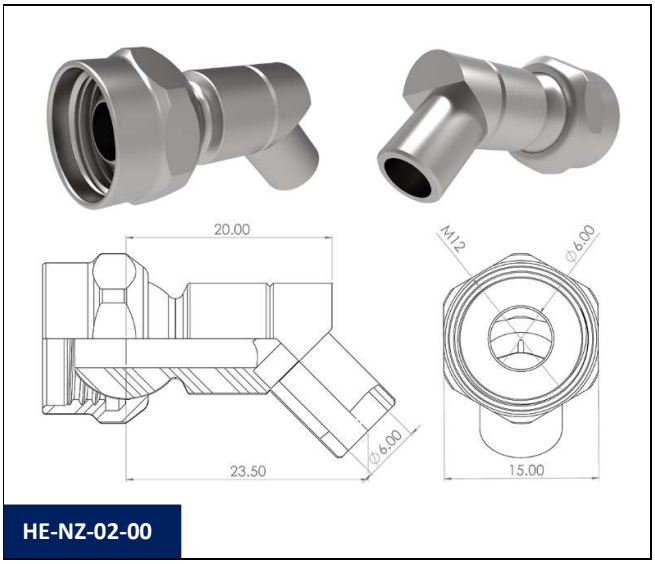


HE-NZ-02-01

HE-NZ-02 Fig. 2 (45º nozzle with tube)

Nozzle with 45º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-02-00	Nozzle 45º. ID:6 mm & L:23.5 mm

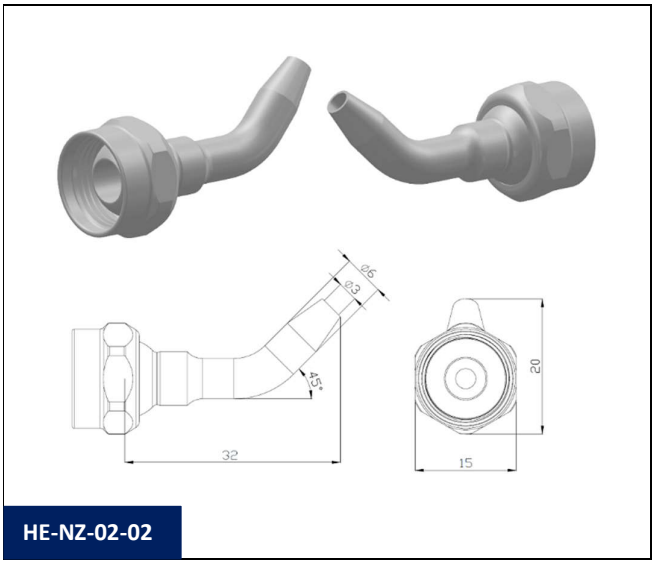


HE-NZ-02-00

HE-NZ-02 Fig. 2 (45º curved nozzle)

Nozzle curved 45º with different outlet diameters to meet diverse angled coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-02-02	Nozzle curved 45º. ID:3 mm & L:32 mm

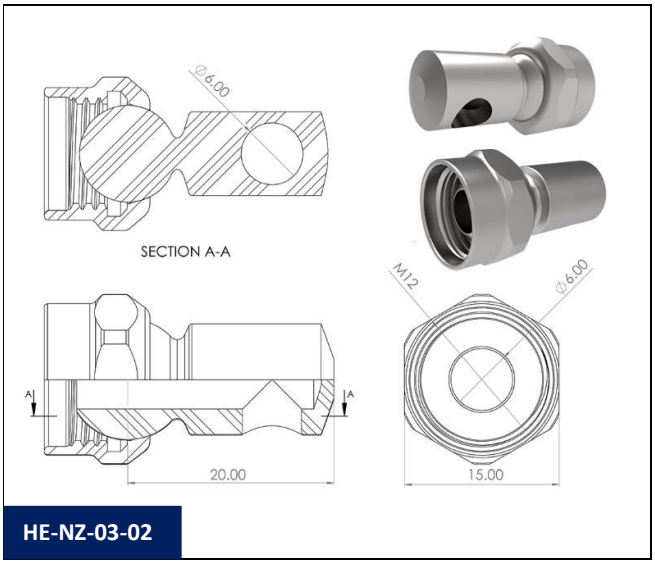


HE-NZ-02-02

HE-NZ-03 Fig. 1 (90º simple nozzle)

Nozzle with 90º hole with different outlet diameters to meet diverse angled coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-03-02	Nozzle 90º simple. ID:6 mm & L:20 mm

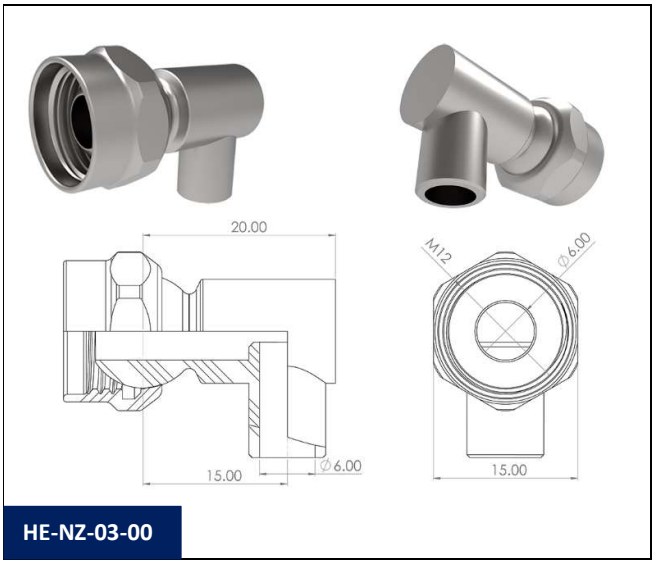


HE-NZ-03-02

HE-NZ-03 Fig. 2 (90º nozzle with tube)

Nozzle with 90º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
HE-NZ-03-00	Nozzle 90º. ID:6 mm & L:20 mm

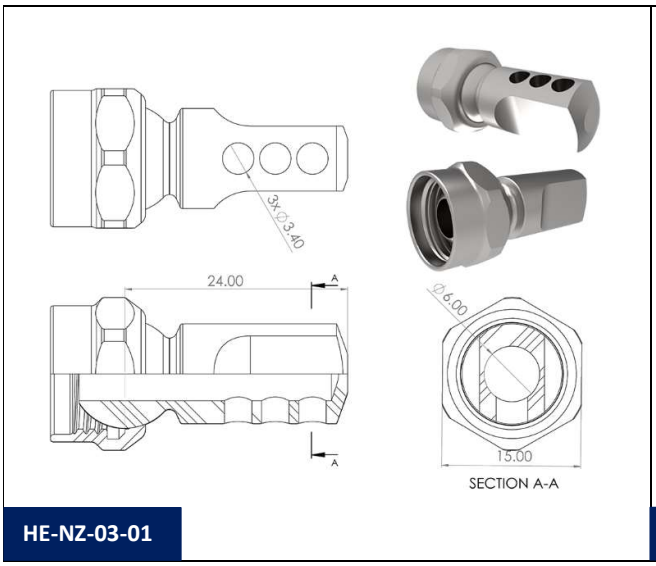


HE-NZ-03-00

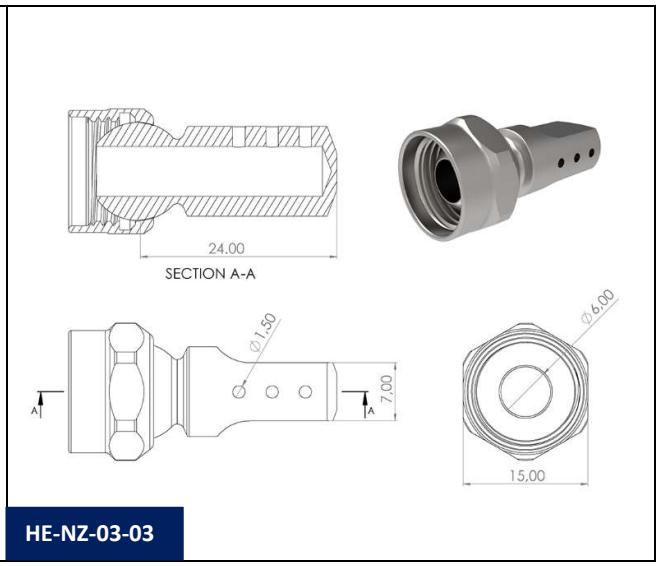
HE-NZ-03 Fig. 3 (90º simple nozzle with 3 outlet holes)

Nozzle with 3 outlet holes at 90º to meet different angled coolant delivery requirements. Ideal to deliver coolant at different sections of a drill or a mill.
Material: Steel

Ref.	Description
HE-NZ-03-01	Nozzle 90º. ID:3.4 mm x 3 & L:24 mm
HE-NZ-03-03	Nozzle 90º. ID:1.5 mm x 3 & L:20 mm



HE-NZ-03-01

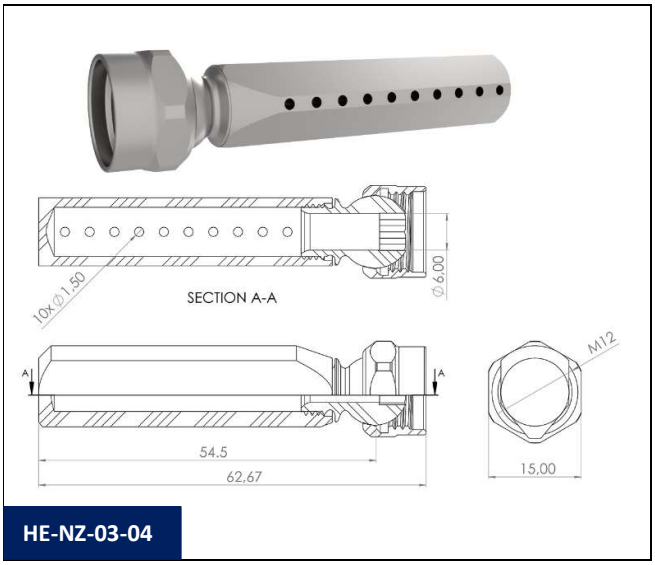


HE-NZ-03-03

HE-NZ-03 Fig. 4 (90º nozzle with 10 outlet holes)

Nozzle with 10 outlet holes at 90º to meet different angled coolant delivery requirements. Ideal to deliver coolant at different sections of a drill or a mill. Also to be used in some grinding applications.
Material: Steel

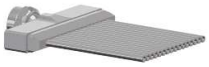
Ref.	Description
HE-NZ-03-04	Nozzle 90º. ID:1.5 x 10 mm & L:54.5 mm



HE-NZ-03-04

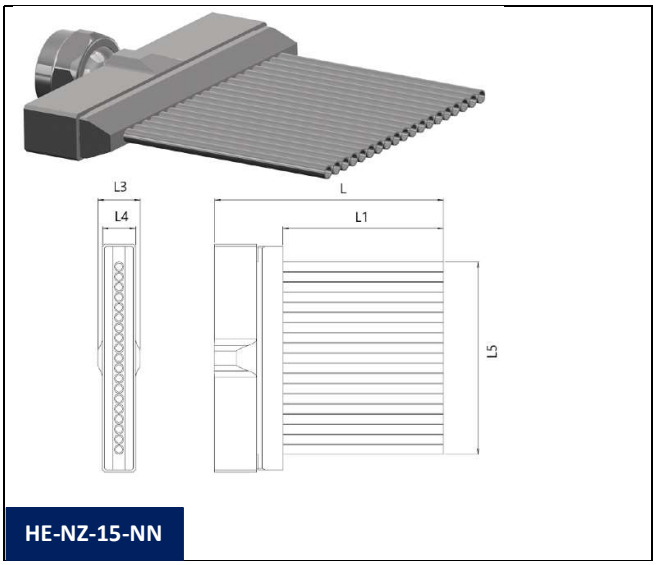
NOZZLES – GRINDING APPLICATIONS

HE-NZ-15 (Nozzle with outlet tubes)



Nozzle with tubes for minimum diffusion of the coolant stream. The design makes it possible to place the nozzle outlets at a minimum distance of the grinding wheel. Ideal to deliver coolant efficiently to the grinding wheel at a minimum distance.
Material: Steel

Ref.	Description
HE-NZ-15-30	Tube nozzle W:30 mm. 6 x Tubes: L:52 mm, ID:2 mm, OD:3 mm, W:19 mm.
HE-NZ-15-40	Tube nozzle W:40 mm. 9 x Tubes: L:52 mm, ID:2 mm, OD:3 mm, W:29 mm.
HE-NZ-15-49	Tube nozzle W:49 mm. 12 x Tubes: L:52 mm, ID:2 mm, OD:3 mm, W:38 mm.
HE-NZ-15-62	Tube nozzle W:62 mm. 16 x Tubes: L:52 mm, ID:2 mm, OD:3 mm, W:51 mm.



HE-NZ-15-NN

HECTO (ID: 6 mm)										
Ref.	Total width	Tubes width (L5)	Number of tubes	Tube OD	Tube ID	Tube Length (L1)	Total through coolant area	Total Length (L)	Total Height (L3)	Height (L4)
HE-NZ-15-30	30 mm	19 mm	6	3 mm	2 mm	52 mm	18.8 mm^2	70.7 mm	12 mm	9 mm
HE-NZ-15-40	39,6 mm	28.6 mm	9	3 mm	2 mm	52 mm	28.3 mm^2	70.7 mm	12 mm	9 mm
HE-NZ-15-49	49,2 mm	38.2 mm	12	3 mm	2 mm	52 mm	37.7 mm^2	70.7 mm	12 mm	9 mm
HE-NZ-15-62	62 mm	51 mm	16	3 mm	2 mm	52 mm	50.3 mm^2	70.7 mm	12 mm	9 mm

HE-NZ-05 (Flat slot nozzle)

Flat slot nozzle with a unique design that allows to regulate and create internal turbulence for an even coolant stream throughout the full length of the slot opening. The flat design allows to place the nozzle at a minimum distance from the grinding wheel.
The nozzles can be ordered with a straight slot (-S) or diverging slot with a small angle (15º) to increase the diffusion of the stream and cover a bigger area (-D).
The opening size of the slot can be ordered in a bigger dimension (different from the standard models) to increase the amount of flow through the slot.
Material: Steel.

Ref.	Description
STRAIGHT SLOT	
HE-NZ-05-20-S	Slot (straight) nozzle with flow regulation W:20 mm, Slot:12 x 2.3 mm
HE-NZ-05-30-S	Slot (straight) nozzle with flow regulation W:30 mm, Slot:22 x 1.3 mm
HE-NZ-05-40-S	Slot (straight) nozzle with flow regulation W:40 mm, Slot:32 x 0.9 mm
HE-NZ-05-50-S	Slot (straight) nozzle with flow regulation W:50 mm, Slot:42 x 0.7 mm
DIVERGING SLOT	
HE-NZ-05-20-D	Slot (diverging) nozzle with flow regulation W:20 mm, Slot:12 x 2.3 mm
HE-NZ-05-30-D	Slot (diverging) nozzle with flow regulation W:30 mm, Slot:22 x 1.3 mm
HE-NZ-05-40-D	Slot (diverging) nozzle with flow regulation W:40 mm, Slot:32 x 0.9 mm
HE-NZ-05-50-D	Slot (diverging) nozzle with flow regulation W:50 mm, Slot:42 x 0.7 mm

Selection: LL-NZ-05-NNN-L-(NN.N)
① ② ③ ④ ⑤

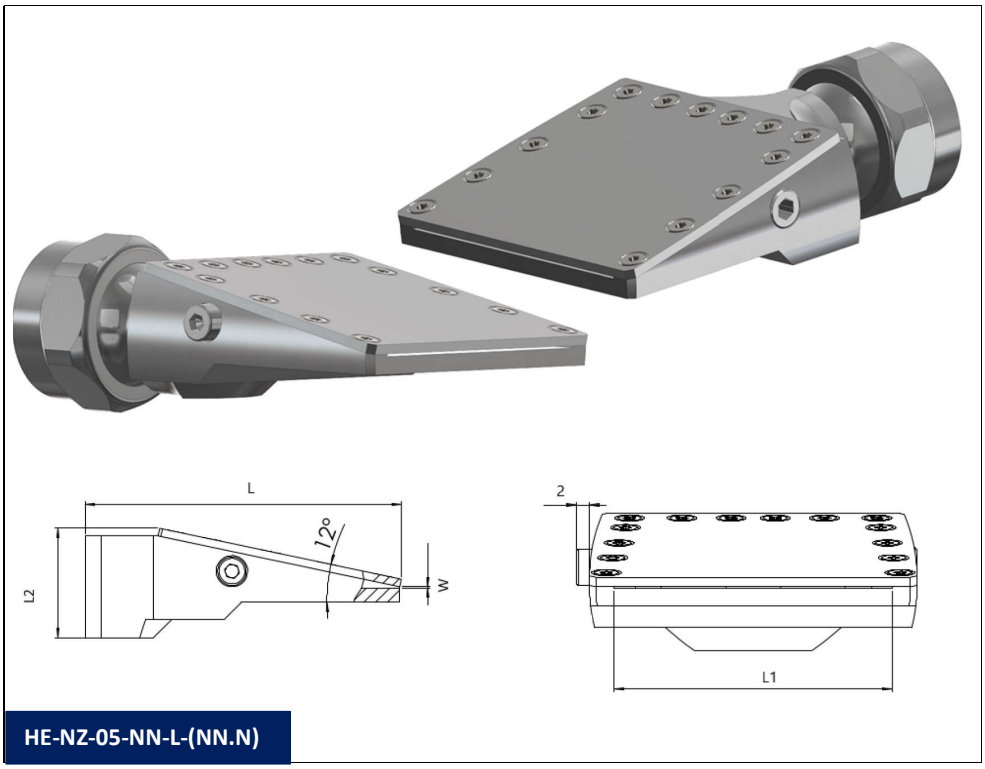
① **Family flow size:** LL
HE: Hecto
ME: Mega
GI: Giga

② **Basic denomination of Nozzle:** -NZ-05

③ **Total nozzle width according to standard dimensions:** NNN

④ **Type of slot:** -L
-S: Straight slot.
-D: Diverging slot with angle opening for a wider coolant stream.

⑤ **Slot opening (W):** (-NN.N)
-Blank: Standard
-NN.N: Special dimension according to customer request. Minimum and maximum according to range of dimension from standard slot opening of each family size.



HE-NZ-05-NN-L-(NN.N)

Instructions to adjust the internal diffuser:

① Loosen the Allen screw which protrudes from the nozzle side.

② Adjust the internal diffuser to regulate the flow turbulence by turning the Allen screw which is integrated in the nozzle side.

③ Tight again the Allen screw described in item ① to fix the position of the internal diffuser.

***Dimensions are subject to changes.**

HECTO (ID: 6 mm)

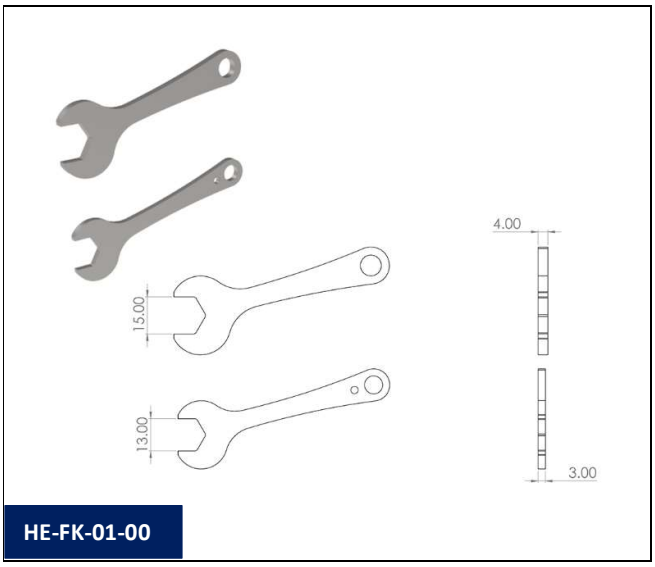
Ref.	Total width	Slot width (L1)	Slot opening (W)	Slot area	Type of slot	Total Length (L)	Total Height (L2)
HE-NZ-05-20-S	20 mm	12.4 mm^2	2.3 mm	28.5 mm^2	Straight	40 mm	16 mm
HE-NZ-05-30-S	30 mm	22.4 mm^2	1.3 mm	29.1 mm^2	Straight	40 mm	16 mm
HE-NZ-05-40-S	40 mm	32.4 mm^2	0.9 mm	29.2 mm^2	Straight	40 mm	16 mm
HE-NZ-05-50-S	50 mm	42.4 mm^2	0.7 mm	29.7 mm^2	Straight	40 mm	16 mm
HE-NZ-05-20-D	20 mm	12.4 mm^2	2.3 mm	28.5 mm^2	Diverging	40 mm	16 mm
HE-NZ-05-30-D	30 mm	22.4 mm^2	1.3 mm	29.1 mm^2	Diverging	40 mm	16 mm
HE-NZ-05-40-D	40 mm	32.4 mm^2	0.9 mm	29.2 mm^2	Diverging	40 mm	16 mm
HE-NZ-05-50-D	50 mm	42.4 mm^2	0.7 mm	29.7 mm^2	Diverging	40 mm	16 mm

FASTENING KEYS FOR HECTO SYSTEM

HE-FK-01 (SW 13 and SW 15)

Special wrenches for fastening the HECTO articulated system.
Maximum torque for locking the parts of the system: 6 Nm

Ref.	Description
HE-FK-01-00	Wrenches for fastening the 2 hexagons used in the HECTO program. SW13 & SW15.



HE-FK-01-00

DISTRIBUTION TUBES

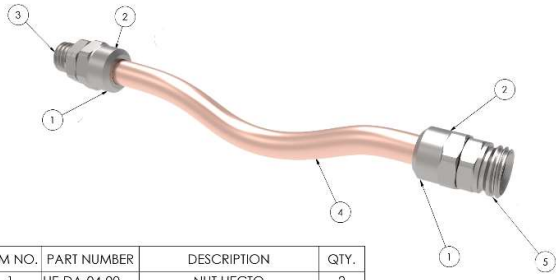
HE-DT-01 (Copper distribution tubes OD:8 mm)

Copper distribution tubes OD:8 mm, ID:6 mm prepared to connect to HECTO nozzles.
On one end: BSPP 1/8"(M) thread to connect to the machine-tool or tool holder.
On the other end: HECTO(F) thread to connect to an HECTO nozzle.
Includes:

- 1 x Copper tube OD: 8 mm with choice of different lengths.
- 1x Initial connection BSPP 1/8"(M) to HECTO (M) ref. HE-IC-03-00
- 2 x Nut HECTO(F) ref. HE-DA-04-00
- 2 x Compression ring ref. HE-DA-04-02
- 1 x Adaptor HECTO(M) to Nut ref. HE-DA-04-01

Maximum pressure: 100 Bar (1,450 psi)

Ref.	Description
HE-DT-01-L102-B1/8	BSPP 1/8"(M) thread, nut and compression ring, copper tube OD:8 mm, ID:6 mm and L:6" (102 mm), other end with compression ring and HECTO(M) thread.
HE-DT-01-L152-B1/8	BSPP 1/8"(M) thread, nut and compression ring, copper tube OD:8 mm, ID:6 mm and L:8" (152 mm), other end with compression ring and HECTO(M) thread.
HE-DT-01-L203-B1/8	BSPP 1/8"(M) thread, nut and compression ring, copper tube OD:8 mm, ID:6 mm and L:8" (203 mm), other end with compression ring and HECTO(M) thread.
HE-DT-01-L305-B1/8	BSPP 1/8"(M) thread, nut and compression ring, copper tube OD:8 mm, ID:6 mm and L:12" (305 mm), other end with compression ring and HECTO(M) thread.
HE-DT-01-L305-B1/8	BSPP 1/8"(M) thread, nut and compression ring, copper tube OD:8 mm, ID:6 mm and L:16" (406 mm), other end with compression ring and HECTO(M) thread.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-04-00	NUT HECTO	2
2	HE-DA-04-02	COMPRESSION RING HECTO	2
3	HE-IC-03-00	BSPP 1/8"(M) to NUT HECTO	1
4	Copper tube	102/152/203/305/406 mm	1
5	HE-DA-04-01	ADAPT. HECTO NUT	1

PART NUMBER	DESCRIPTION
HE-DT-01-00	L = 102 mm
HE-DT-01-01	L = 152 mm
HE-DT-01-02	L = 203 mm
HE-DT-01-03	L = 305 mm
HE-DT-01-04	L = 406 mm

HE-DT-01 LNNN-T(M)

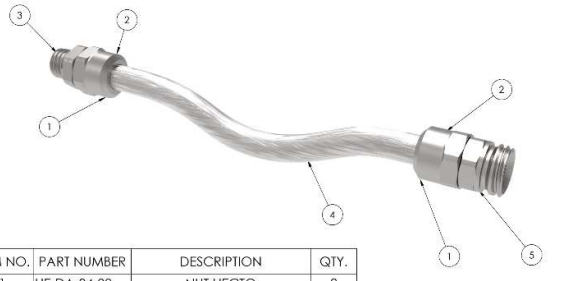
HE-DT-02 (Steel distribution tubes OD: 8 mm)

Steel distribution tubes OD:8 mm, ID:6 mm prepared to connect to HECTO nozzles.
On one end: BSPP 1/8"(M) thread to connect to the machine-tool or tool holder.
On the other end: HECTO(F) thread to connect to an HECTO nozzle.
Includes:

- 1 x Steel tube OD: 8 mm with choice of different lengths.
- 1x Initial connection BSPP 1/8"(M) to HECTO (M) ref. HE-IC-03-00
- 2 x Nut HECTO(F) ref. HE-DA-04-00
- 2 x Compression ring ref. HE-DA-04-02
- 1 x Adaptor HECTO(M) to Nut ref. HE-DA-04-01

Maximum pressure: 100 Bar (1,450 psi)

Ref.	Description
HE-DT-02-L102-B1/8	BSPP 1/8"(M) thread, nut and compression ring, steel tube OD:8 mm, ID:6 mm and L:6" (102 mm), other end with compression ring and HECTO(M) thread.
HE-DT-02-L152-B1/8	BSPP 1/8"(M) thread, nut and compression ring, steel tube OD:8 mm, ID:6 mm and L:8" (152 mm), other end with compression ring and HECTO(M) thread.
HE-DT-02-L203-B1/8	BSPP 1/8"(M) thread, nut and compression ring, steel tube OD:8 mm, ID:6 mm and L:8" (203 mm), other end with compression ring and HECTO(M) thread.
HE-DT-02-L305-B1/8	BSPP 1/8"(M) thread, nut and compression ring, steel tube OD:8 mm, ID:6 mm and L:12" (305 mm), other end with compression ring and HECTO(M) thread.
HE-DT-02-L406-B1/8	BSPP 1/8"(M) thread, nut and compression ring, steel tube OD:8 mm, ID:6 mm and L:16" (406 mm), other end with compression ring and HECTO(M) thread.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-04-00	NUT HECTO	2
2	HE-DA-04-02	COMPRESSION RING HECTO	2
3	HE-IC-03-00	BSPP 1/8"(M) to NUT HECTO	1
4	Steel tube	102/152/203/305 mm	1
5	HE-DA-04-01	ADAPT. HECTO NUT	1

PART NUMBER	DESCRIPTION
HE-DT-02-00	L = 102 mm
HE-DT-02-01	L = 152 mm
HE-DT-02-02	L = 203 mm
HE-DT-02-03	L = 305 mm

HE-DT-02-LNNN-T(M)

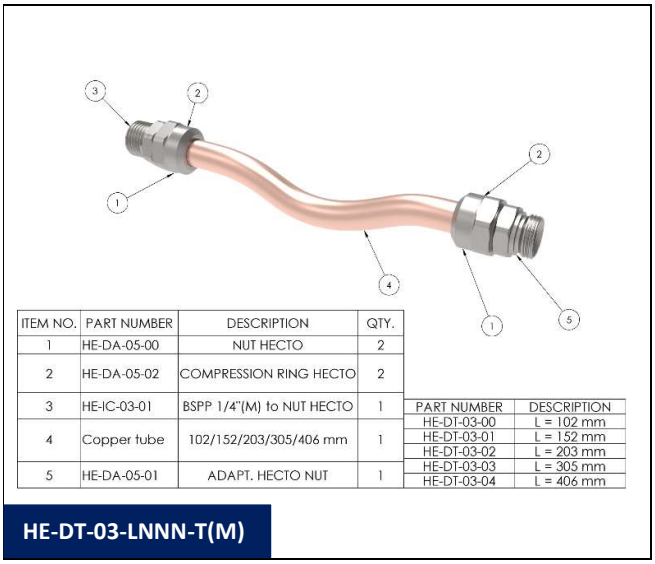
HE-DT-03 (Copper distribution tubes OD:10 mm)

Copper distribution tubes OD:10 mm, ID:8 mm prepared to connect to HECTO nozzles.
On one end: BSPP 1/4"(M) thread to connect to the machine-tool or tool holder.
On the other end: HECTO(F) thread to connect to an HECTO nozzle.
Includes:

- 1 x Copper tube OD: 10 mm with choice of different lengths.
- 1x Initial connection BSPP 1/4"(M) to HECTO (M) ref. HE-IC-03-01
- 2 x Nut HECTO(F) ref. HE-DA-05-00
- 2 x Compression ring ref. HE-DA-05-02
- 1 x Adaptor HECTO(M) to Nut ref. HE-DA-05-01

Maximum pressure: 100 Bar (1,450 psi)

Ref.	Description
HE-DT-03-L102-B1/4	BSPP 1/4"(M) thread, nut and compression ring, copper tube OD:10 mm, ID:8 mm and L:6" (102 mm), other end with compression ring and HECTO(M) thread.
HE-DT-03-L152-B1/4	BSPP 1/4"(M) thread, nut and compression ring, copper tube OD:10 mm, ID:8 mm and L:8" (152 mm), other end with compression ring and HECTO(M) thread.
HE-DT-03-L203-B1/4	BSPP 1/4"(M) thread, nut and compression ring, copper tube OD:10 mm, ID:8 mm and L:8" (203 mm), other end with compression ring and HECTO(M) thread.
HE-DT-03-L305-B1/4	BSPP 1/4"(M) thread, nut and compression ring, copper tube OD:10 mm, ID:8 mm and L:12" (305 mm), other end with compression ring and HECTO(M) thread.
HE-DT-03-L406-B1/4	BSPP 1/4"(M) thread, nut and compression ring, copper tube OD:10 mm, ID:8 mm and L:16" (406 mm), other end with compression ring and HECTO(M) thread.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-05-00	NUT HECTO	2
2	HE-DA-05-02	COMPRESSION RING HECTO	2
3	HE-IC-03-01	BSPP 1/4"(M) to NUT HECTO	1
4	Copper tube	102/152/203/305/406 mm	1
5	HE-DA-05-01	ADAPT. HECTO NUT	1

PART NUMBER	DESCRIPTION
HE-DT-03-00	L = 102 mm
HE-DT-03-01	L = 152 mm
HE-DT-03-02	L = 203 mm
HE-DT-03-03	L = 305 mm
HE-DT-03-04	L = 406 mm

HE-DT-03-LNNN-T(M)

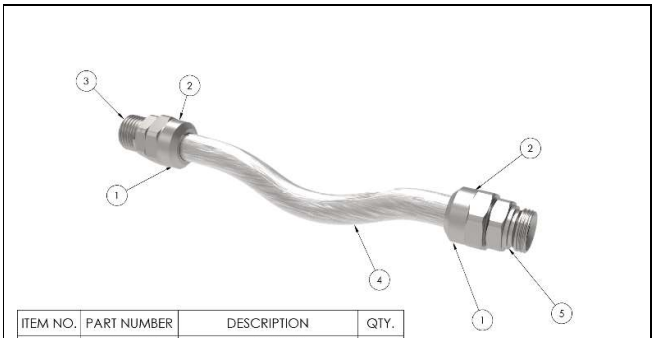
HE-DT-04 (Steel distribution tubes OD:10 mm)

Steel distribution tubes OD:10 mm, ID:8 mm prepared to connect to HECTO nozzles.
On one end: BSPP 1/4"(M) thread to connect to the machine-tool or tool holder.
On the other end: HECTO(F) thread to connect to an HECTO nozzle.
Includes:

- 1 x Steel tube OD: 10 mm with choice of different lengths.
- 1x Initial connection BSPP 1/4"(M) to HECTO (M) ref. HE-IC-03-01
- 2 x Nut HECTO(F) ref. HE-DA-05-00
- 2 x Compression ring ref. HE-DA-05-02
- 1 x Adaptor HECTO(M) to Nut ref. HE-DA-05-01

Maximum pressure: 100 Bar (1,450 psi)

Ref.	Description
HE-DT-04-L102-B1/4	BSPP 1/4"(M) thread, nut and compression ring, steel tube OD:10 mm, ID:8 mm and L:6" (102 mm), other end with compression ring and HECTO(M) thread.
HE-DT-04-L152-B1/4	BSPP 1/4"(M) thread, nut and compression ring, steel tube OD:10 mm, ID:8 mm and L:8" (152 mm), other end with compression ring and HECTO(M) thread.
HE-DT-04-L203-B1/4	BSPP 1/4"(M) thread, nut and compression ring, steel tube OD:10 mm, ID:8 mm and L:8" (203 mm), other end with compression ring and HECTO(M) thread.
HE-DT-04-L305-B1/4	BSPP 1/4"(M) thread, nut and compression ring, steel tube OD:10 mm, ID:8 mm and L:12" (305 mm), other end with compression ring and HECTO(M) thread.
HE-DT-04-L406-B1/4	BSPP 1/4"(M) thread, nut and compression ring, steel tube OD:10 mm, ID:8 mm and L:16" (406 mm), other end with compression ring and HECTO(M) thread.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-05-00	NUT HECTO	2
2	HE-DA-05-02	COMPRESSION RING HECTO	2
3	HE-IC-03-01	BSPP 1/4"(M) to NUT HECTO	1
4	Steel tube	102/152/203/305/406 mm	1
5	HE-DA-05-01	ADAPT. HECTO NUT	1

PART NUMBER	DESCRIPTION
HE-DT-04-00	L = 102 mm
HE-DT-04-01	L = 152 mm
HE-DT-04-02	L = 203 mm
HE-DT-04-03	L = 305 mm
HE-DT-04-04	L = 406 mm

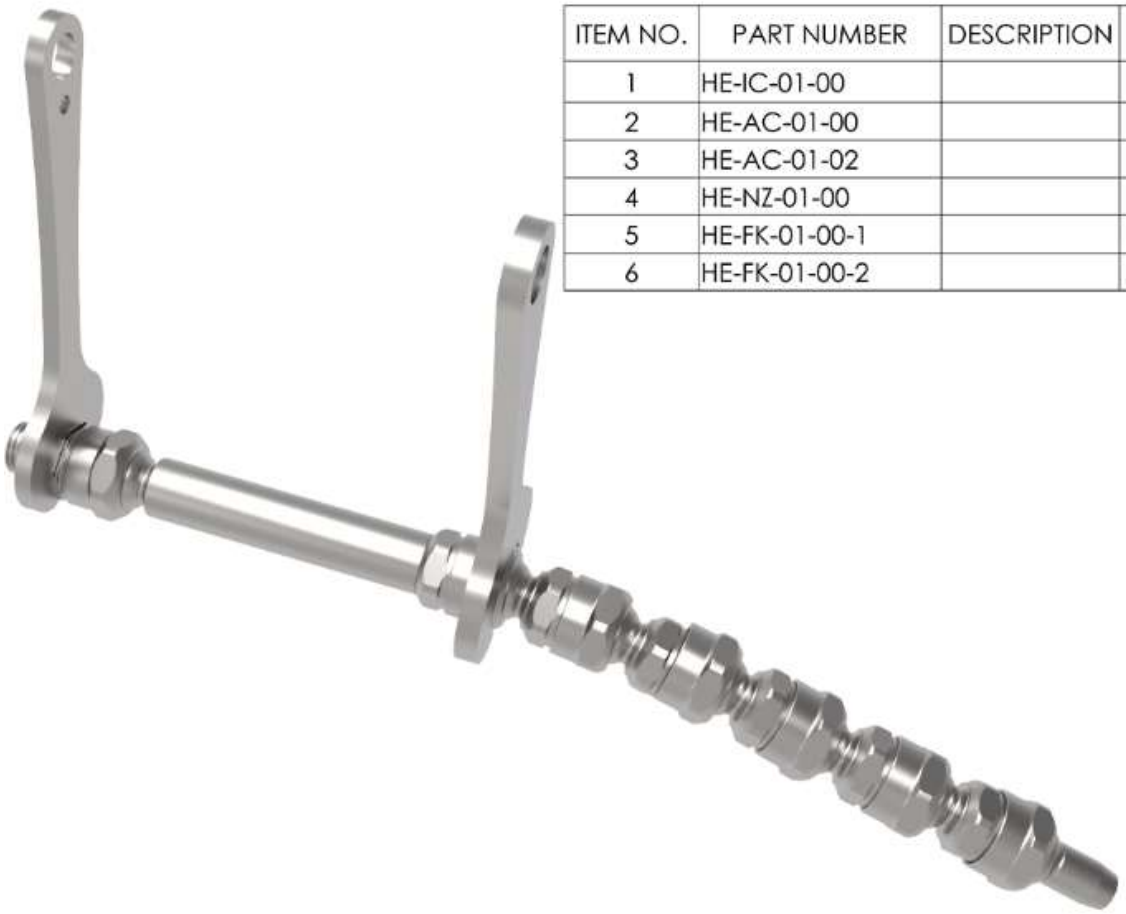
HE-DT-04-LNNN-T(M)

STARTER KITS

HE-SK-01-00 (Kit single outlet HECTO)

Set of components to start and become familiar with the SCS Articulated Coolant Distribution System HECTO program. Basic set of components delivered in a basic kit for the most typical applications.

Ref.	Description
HE-SK-01-00	**Kit Single Outlet HECTO:** **For general cooling with a single outlet L=220 mm.** **Weight: 120 g.** ***Initial Connection:*** 1 unit HE-IC-01-00 BSPP 1/8"(M) to articulated connection HECTO. ***Articulated connection:*** 5 units HE-AC-01-00 Articulated connection HECTO L:20.5 mm 1 unit HE-AC-01-02 Articulated connection HECTO L:70.5 mm ***Coolant nozzles:*** 1 unit HE-NZ-01-00 Straight nozzle. ID:6 mm & L:16 mm ***Fastening wrenches for the articulated system:*** 1 unit HE-FK-01-00 Wrenches for fastening the 2 hexagons used in the HECTO program. SW13 & SW15.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-IC-01-00		1
2	HE-AC-01-00		5
3	HE-AC-01-02		1
4	HE-NZ-01-00		1
5	HE-FK-01-00-1		1
6	HE-FK-01-00-2		1

HE-SK-01-00

MEGA (10.5 mm) PROGRAM

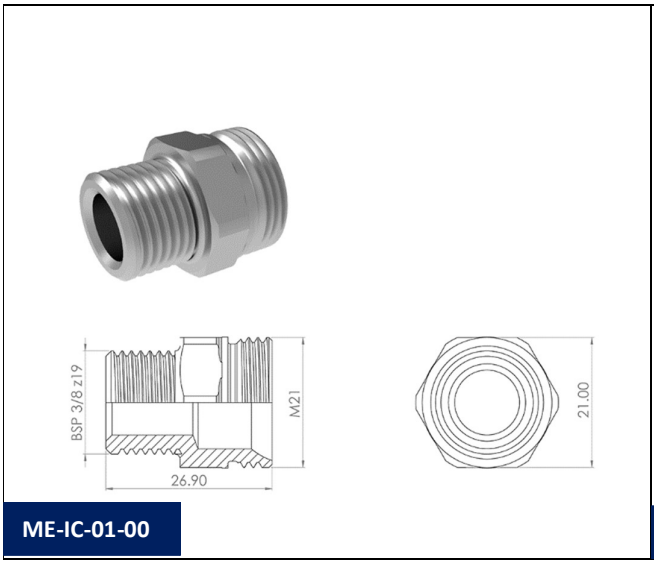
The internal through hole of the MEGA program is 10.5 mm and is ideal for the distribution of air and refrigerant (oil or emulsion) in medium and large-sized machines such as CNC lathes, machining centers, grinding machines or as distribution branches of the biggest program (GIGA).
Maximum torque for locking the parts of the system: 28 Nm
Maximum pressure: 80 Bar (1,160 psi)

INITIAL CONNECTION

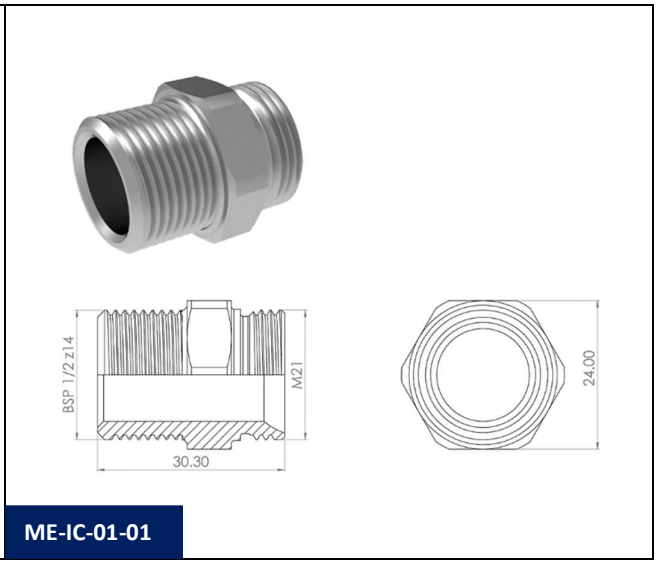
ME-IC-01 Fig. 1 (Male to MEGA)

Male thread connection elements to connect to the machine-tool or other SCS coolant distribution programs. ID:10.5 mm.
Material: Steel

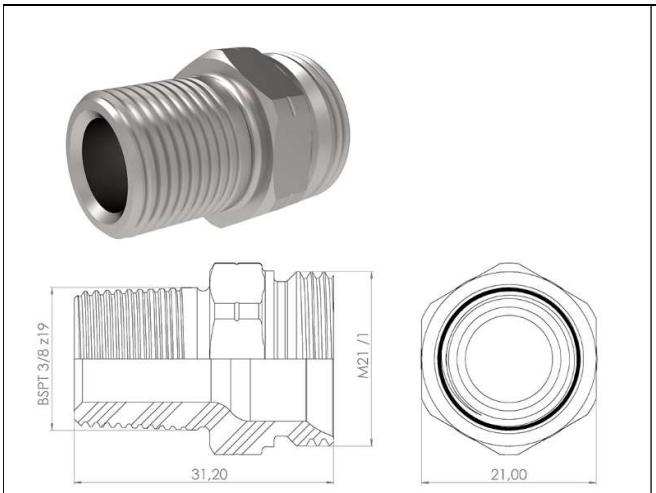
Ref.	Description
ME-IC-01-00	BSPP 3/8"(M) to articulated connection MEGA.
ME-IC-01-01	BSPP 1/2"(M) to articulated connection MEGA.
ME-IC-01-04	BSPT 3/8"(M) to articulated connection MEGA.
ME-IC-01-05	BSPT 1/2"(M) to articulated connection MEGA.
ME-IC-01-02	NPT 3/8"(M) to articulated connection MEGA.
ME-IC-01-03	NPT 1/2"(M) to articulated connection MEGA.



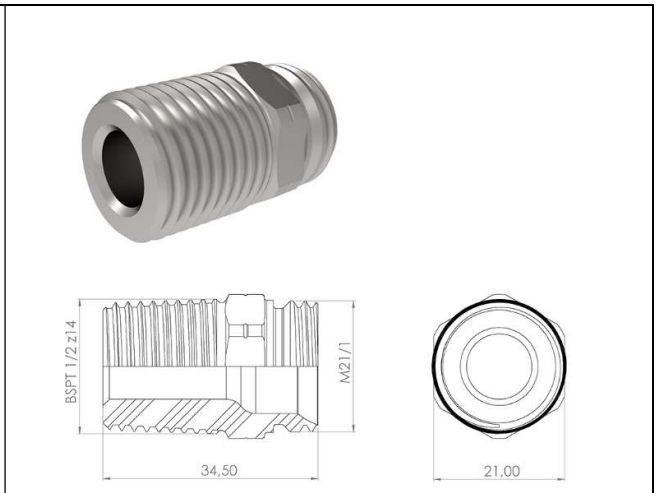
ME-IC-01-00



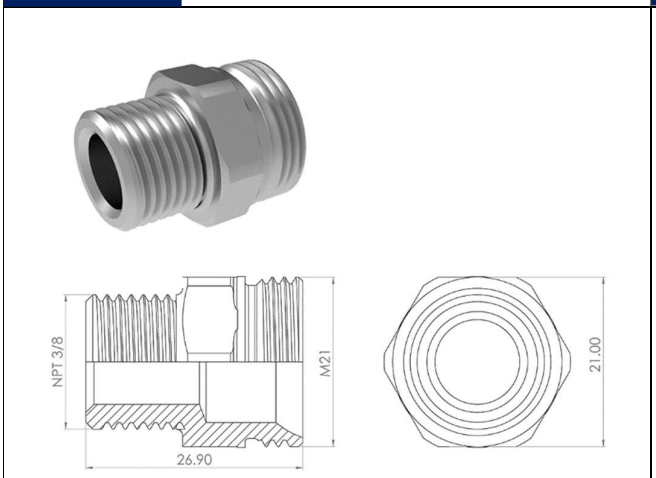
ME-IC-01-01



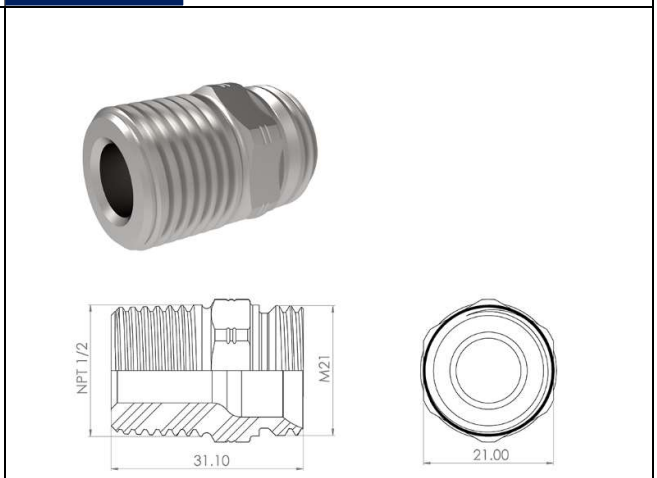
ME-IC-01-04



ME-IC-01-05



ME-IC-01-02



ME-IC-01-03

QUICK POSSITIONED CONNECTIONS

ME-QP-01 (Male to MEGA)

Positioned quick connection to substitute initial connection ME-IC-01 Fig 1. ID:10.5 mm.
Material: Steel

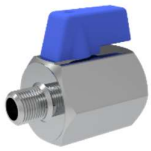
Ref.	Description
ME-QP-01-00	Quick connection positioned BSPP3/8"(M) to articulated connection MEGA.
ME-QP-01-01	Quick connection positioned BSPT3/8"(M) to articulated connection MEGA.

ME-QP-01-00

ME-QP-01-01

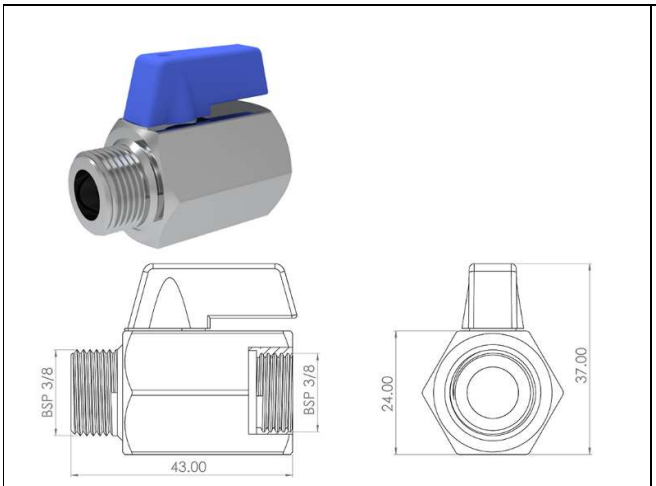
BALL VALVES

UN-VA-01 (PN10 – Male to Female)

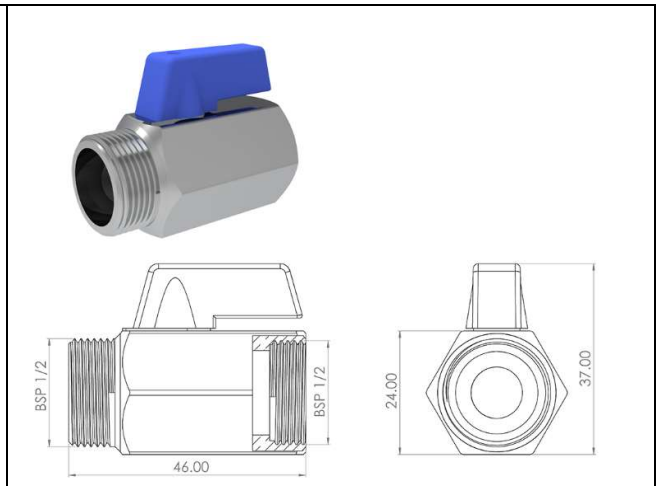


Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 10 bar (145 psi).
Material: Chrome plated brass.

Ref.	Description
UN-VA-01-02	Closing valve PN10, BSPP 3/8"(M) and BSPP 3/8"(F) chromed-plated brass.
UN-VA-01-03	Closing valve PN10, BSPP 1/2"(M) and BSPP 1/2"(F) chromed-plated brass.



UN-VA-01-02

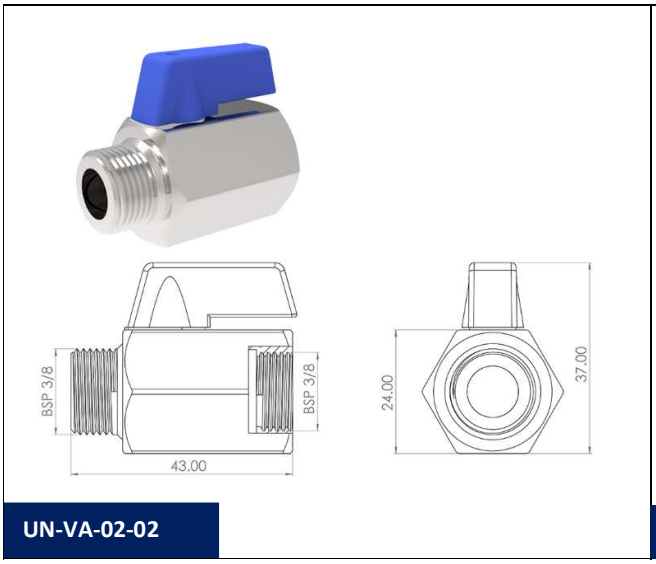


UN-VA-01-03

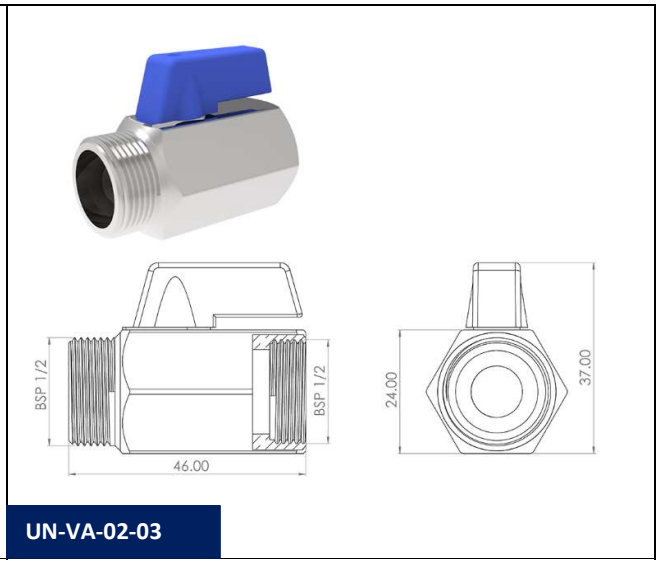
UN-VA-02 (PN63 – Male to Female)

Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 63 bar (914 psi).
Material: Stainless steel AISI-316

Ref.	Description
UN-VA-02-02	Closing valve PN63, BSPP 3/8"(M) and BSPP 3/8"(F) AISI-316
UN-VA-02-03	Closing valve PN63, BSPP 1/2"(M) and BSPP 1/2"(F) AISI-316



UN-VA-02-02



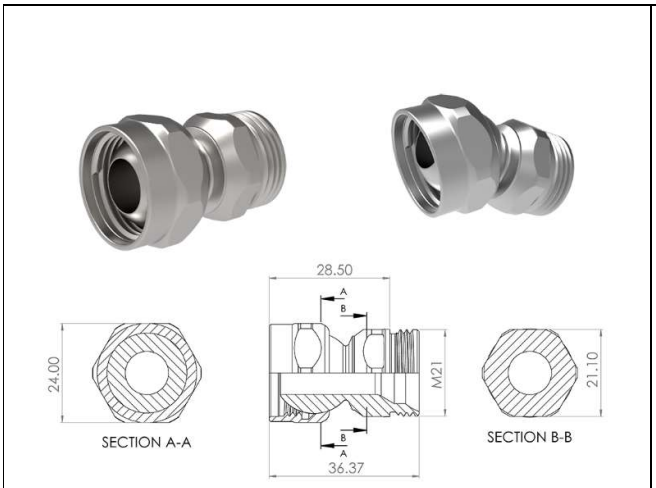
UN-VA-02-03

ARTICULATED CONNECTIONS

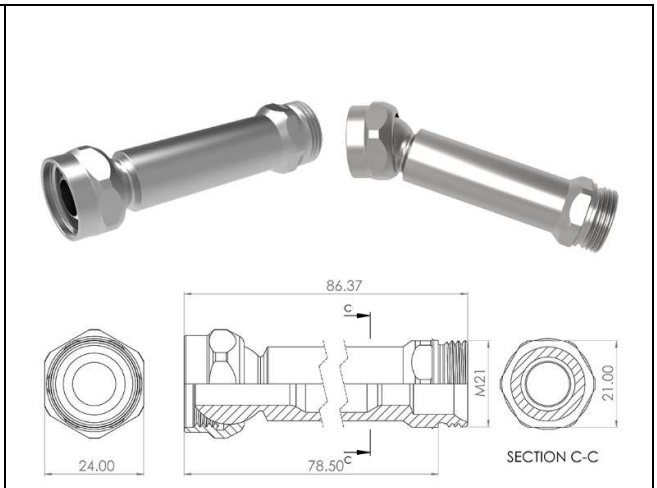
ME-AC-01 (Straight connection)

Basic straight articulated elements which connect to an initial connection, to another articulated connection, to a quick positioned connection or to a nozzle. Swiveling ±25º. ID:10.5 mm.
Material: Steel

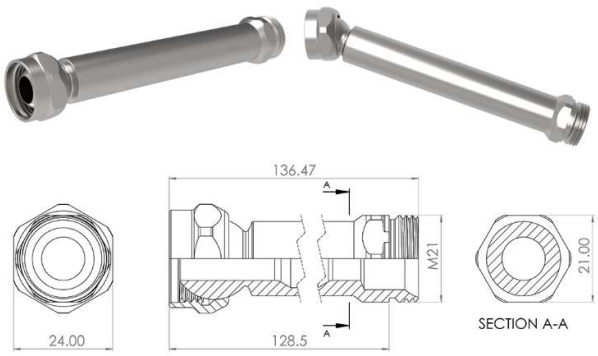
Ref.	Description
ME-AC-01-00	Articulated connection MEGA L:28.5 mm
ME-AC-01-01	Articulated connection MEGA L:78.5 mm
ME-AC-01-02	Articulated connection MEGA L:128.5 mm
ME-AC-01-03	Articulated connection MEGA L:178.5 mm
ME-AC-01-04	Articulated connection MEGA L:228.5 mm



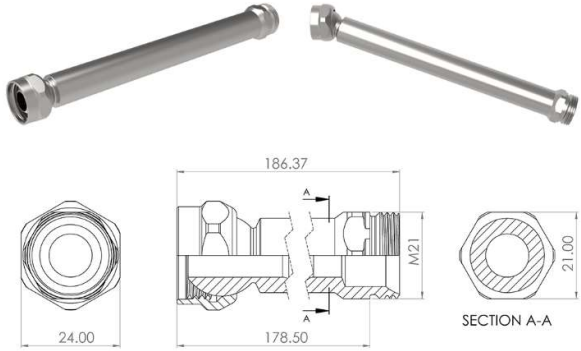
ME-AC-01-00



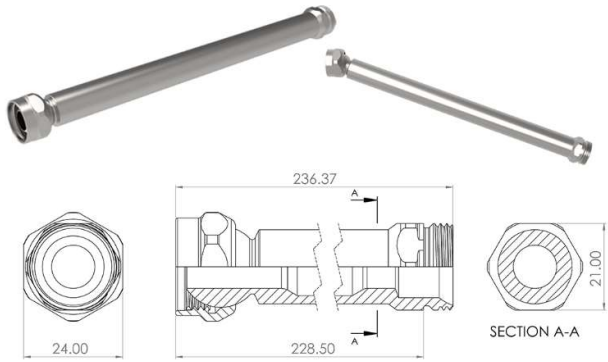
ME-AC-01-01



ME-AC-01-02



ME-AC-01-03

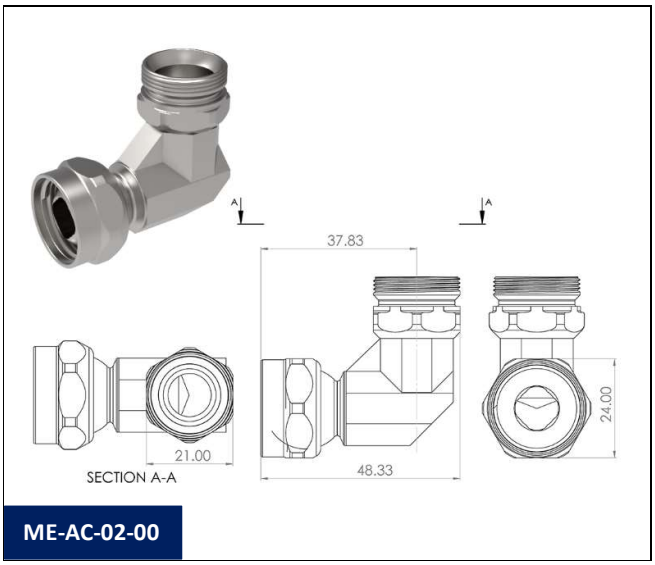


ME-AC-01-04

ME-AC-02 (90º connection)

90º articulated elements which connect to an initial connection, to a straight connection, to a quick positioned connection or to a nozzle. Swiveling ±25º. ID:10.5 mm.
Material: Steel

Ref.	Description
ME-AC-02-00	Articulated connection to 90º MEGA



ME-AC-02-00

ME-AC-05 (Straight connection with non-return valve)

Straight articulation with non-return valve which connects to an initial connection, to an articulated connection, to a quick positioned connection or to a nozzle. Ideal for general machining applications or grinding. It allows to avoid:

- Any time delay between activation of the coolant pump and delivery of coolant because the line remains full of coolant.
- Dripping of coolant when the cooling pump is stopped, thus avoiding situation in which coolant falls on the machine operator when setting or inspecting the work part.

Swiveling ±25º. ID:10.5 mm.
Minimum opening pressure: 0.1 Bar
Material: Steel

Ref.	Description
ME-AC-05-00	Articulated connection MEGA with non-return valve L:39 mm

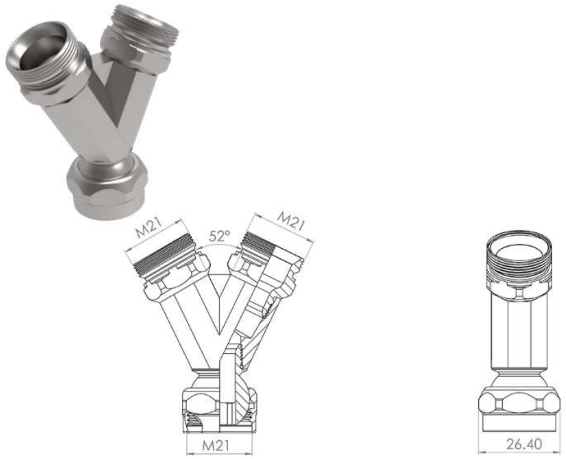
ME-AC-05-00

DISTRIBUTORS AND ADAPTORS

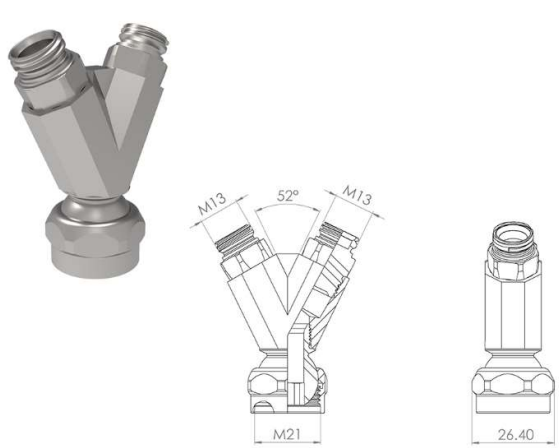
ME-DA-01 (52º Split distributor)

Coolant split distributor 52º (“Y” type). Expansion of articulated lines and adaption to other SCS coolant distribution systems.
Material: Steel

Ref.	Description
ME-DA-01-00	“Y” distributor to articulated connection MEGA
ME-DA-01-01	“Y” distributor MEGA with outlets to articulated connection HECTO
ME-DA-02-00	Articulated connection MEGA to HECTO outlet L:76.5 mm



ME-DA-01-00

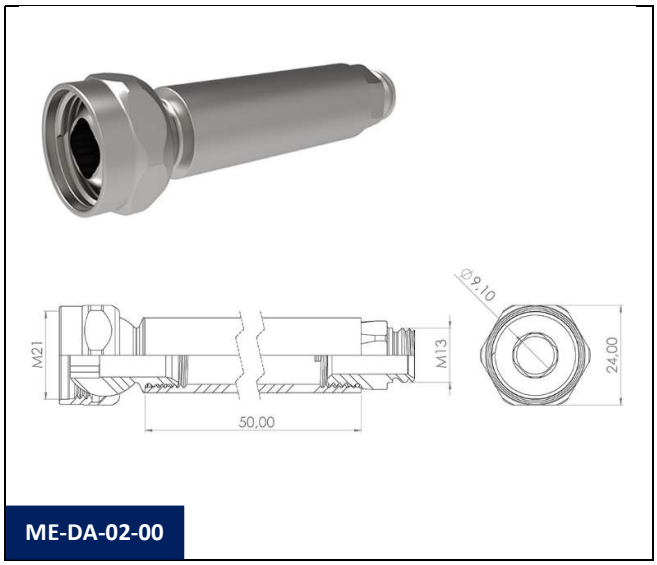


ME-DA-01-01

ME-DA-02 (Articulated adaptor MEGA(F) to HECTO(M))

Straight articulated connection adaptor MEGA(F) to HECTO(M). Allows to connect parts of the MEGA program to the HECTO program. Swiveling ±25º. ID:6 mm.
Material: Steel

Ref.	Description
ME-DA-02-00	Articulated connection MEGA(F) to HECTO(M) outlet L:76.5 mm

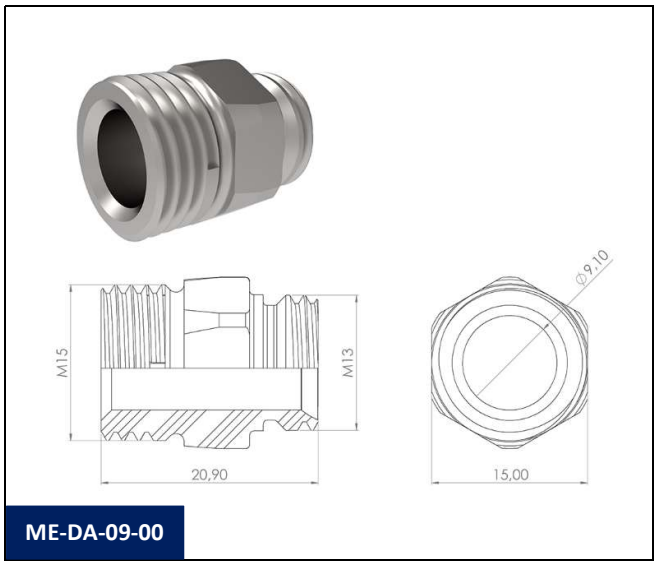


ME-DA-02-00

ME-DA-09 (Adaptor MEGA(M) to HECTO(M))

Adaptor MEGA(M) to HECTO(M). Allows to connect parts of the MEGA program to the HECTO program.
Swiveling ±25º. ID:6 mm.
Material: Steel

Ref.	Description
ME-DA-09-00	Adaptor MEGA (M) to HECTO (M)



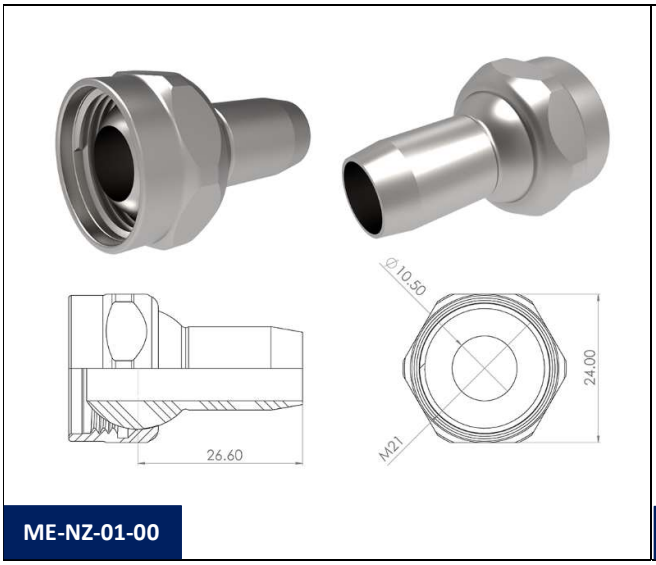
ME-DA-09-00

NOZZLES – GENERAL APPLICATIONS

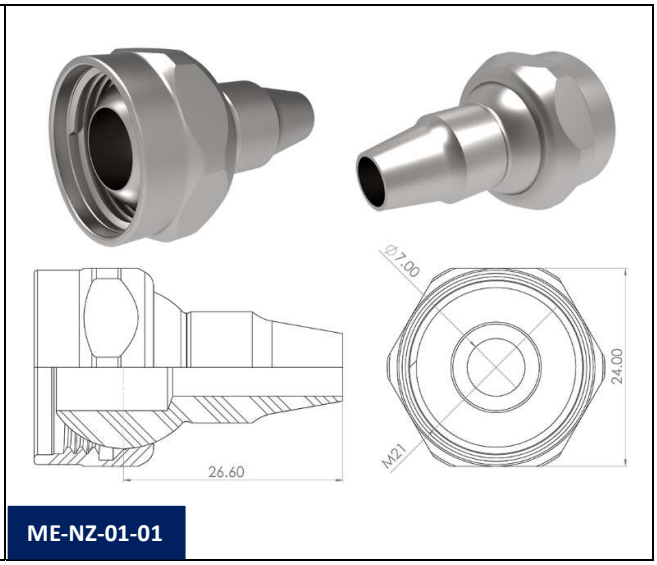
ME-NZ-01 Fig. 1 (Straight short nozzle)

Straight short nozzles with different outlet diameters to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-01-00	Straight nozzle ID:10.5 mm & L:27 mm
ME-NZ-01-01	Straight nozzle ID:7 mm & L:27



ME-NZ-01-00

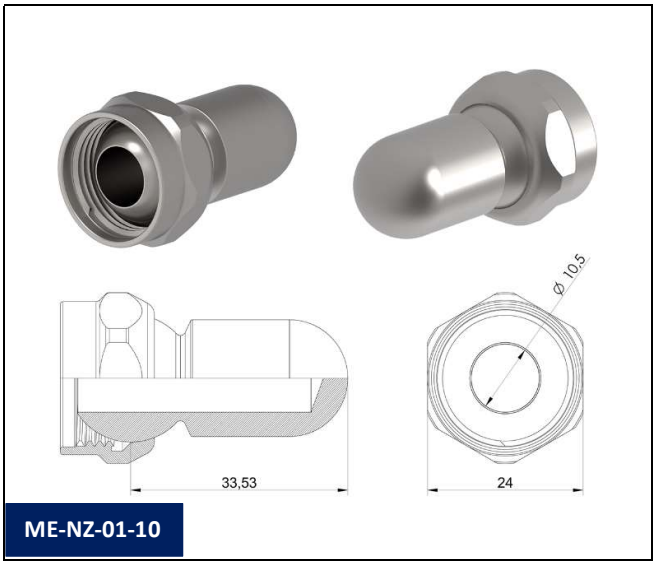


ME-NZ-01-01

ME-NZ-01 Fig. 2 (Blind short nozzle)

Short nozzle prepared to be drilled by the end-user to the required outlet diameter
Material: Steel

Ref.	Description
ME-NZ-01-10	Straight nozzle ID:0 mm & L:34 mm

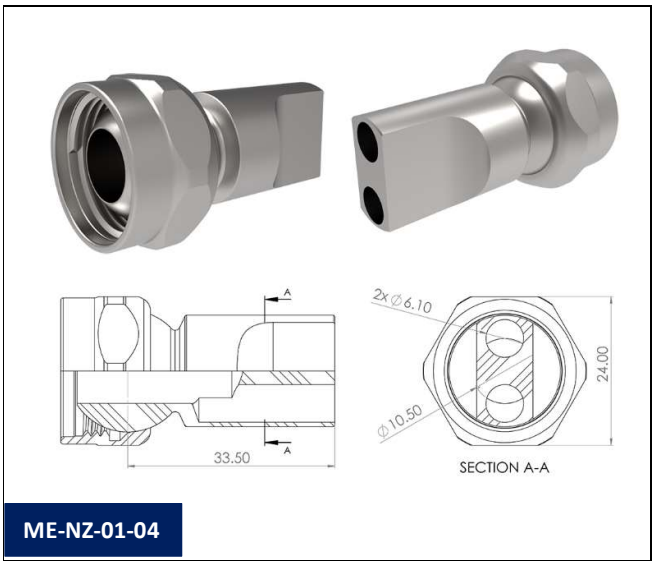


ME-NZ-01-10

ME-NZ-01 Fig. 3 (Straight nozzle multiple linear outlet)

Straight nozzles with multiple outlet holes to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-01-04	Straight nozzle ID:6 mm x2 & L:34 mm

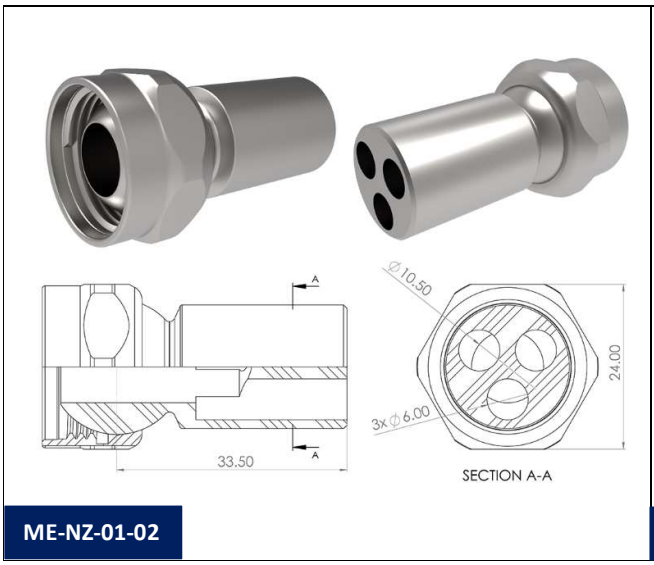


ME-NZ-01-04

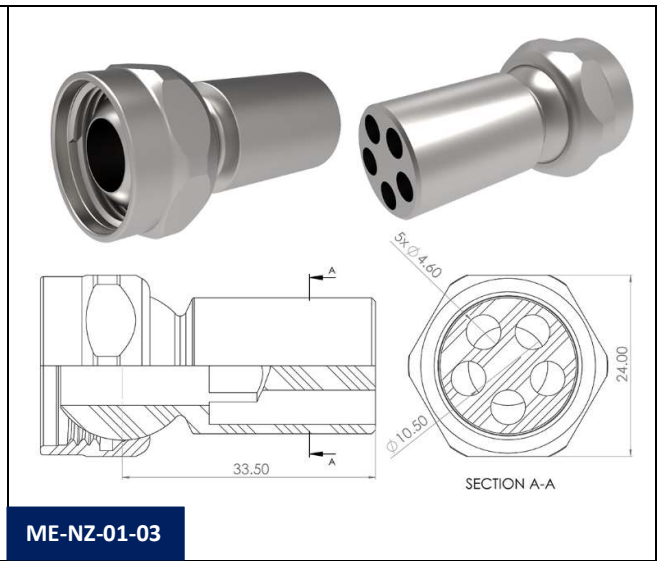
ME-NZ-01 Fig. 4 (Straight nozzle coaxial outlet)

Straight coaxial nozzles with multiple outlet holes to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-01-02	Straight coaxial nozzle ID:6 mm x 3 & L:34
ME-NZ-01-03	Straight coaxial nozzle ID:4.6 mm x 5 & L:34



ME-NZ-01-02

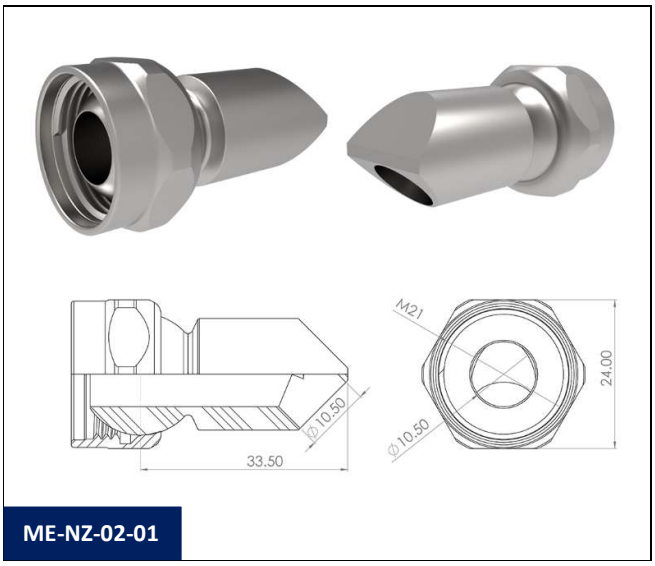


ME-NZ-01-03

ME-NZ-02 Fig. 1 (45º simple nozzle)

Nozzle with 45º hole outlet for angled coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-02-01	Nozzle 45º simple ID:10.5 mm & L:34 mm

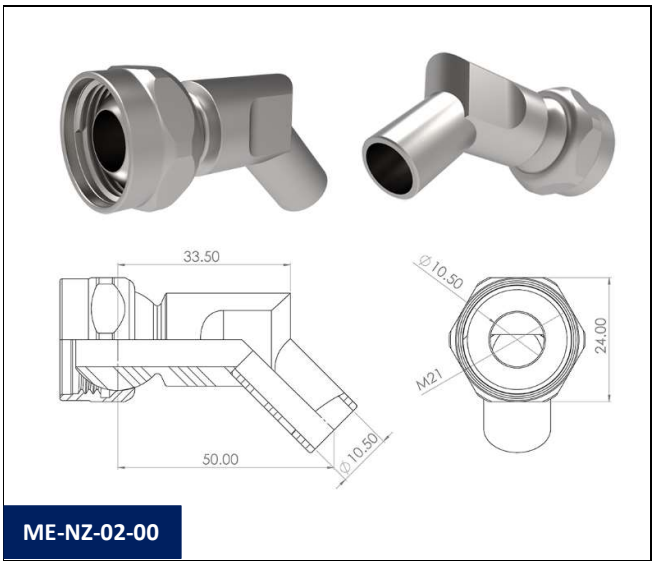


ME-NZ-02-01

ME-NZ-02 Fig. 2 (45º nozzle with tube)

Nozzle with 45º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-02-00	Nozzle 45º ID:10.5 mm & L:50 mm

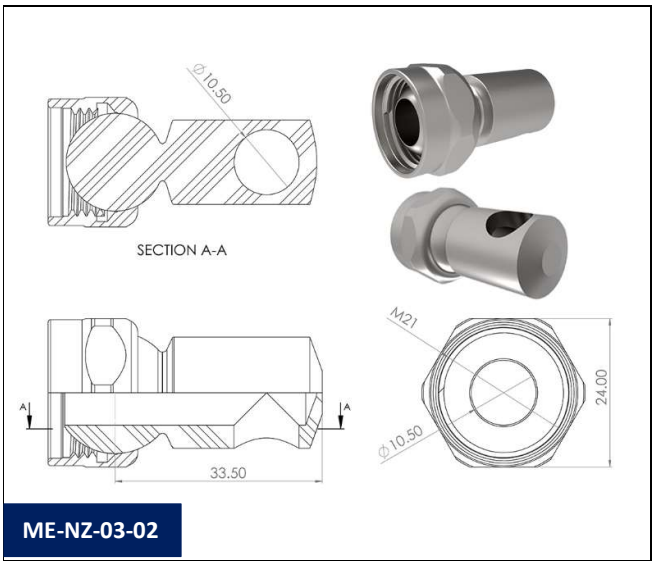


ME-NZ-02-00

ME-NZ-03 Fig. 1 (90º simple nozzle)

Nozzle with 90º hole with different outlet diameters to meet different angled coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-03-02	Nozzle 90º simple ID:10.5 mm & L:34 mm

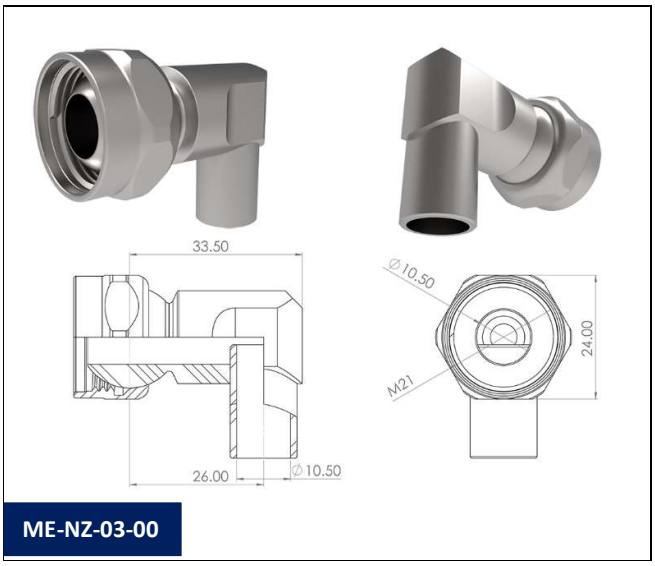


ME-NZ-03-02

ME-NZ-03 Fig. 2 (90º nozzle with tube)

Nozzle with 90º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
ME-NZ-03-00	Nozzle 90º ID:10.5 mm & L:34 mm

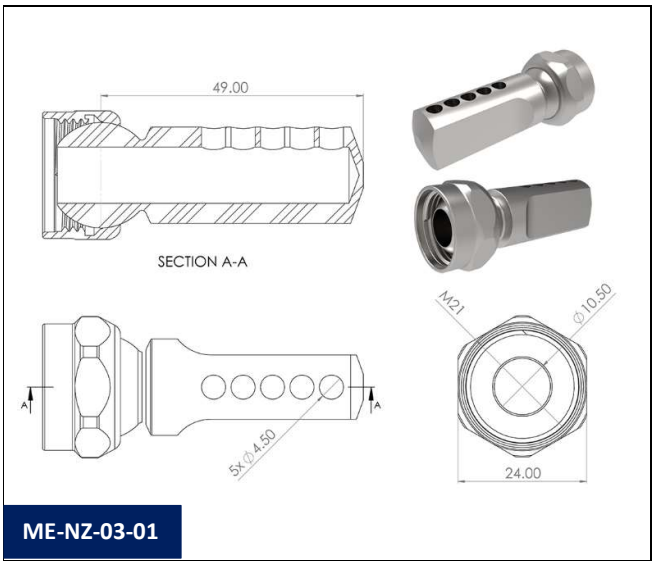


ME-NZ-03-00

ME-NZ-03 Fig. 3 (90º simple nozzle with 5 outlet holes)

Nozzle with 5 outlet holes at 90º to meet different angled coolant delivery requirements. Ideal to deliver coolant at different sections of a drill or a mill or for grinding applications.
Material: Steel

Ref.	Description
ME-NZ-03-01	Nozzle 90º ID:4.5 mm x 5 & L:49 mm



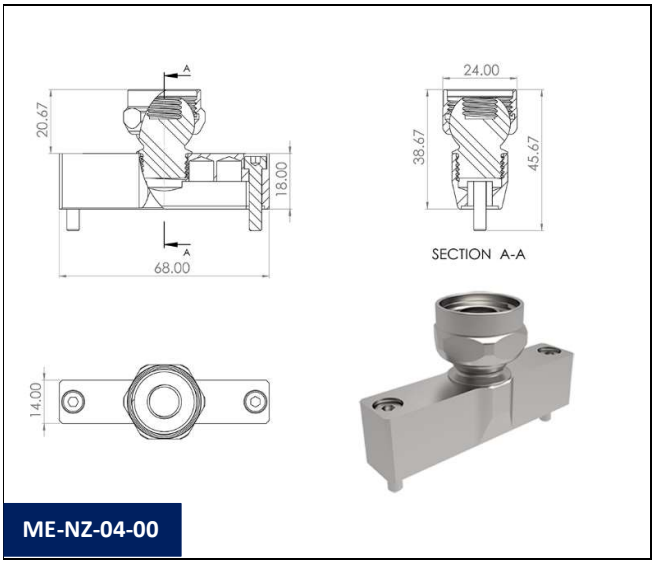
ME-NZ-03-01

NOZZLES – MODULAR DESIGN FOR GRINDING & GENERAL APPLICATIONS

ME-NZ-04 Fig. 1 (Nozzle base)

Nozzle base to assemble flat slot nozzle or multi-bore type nozzle. Allows order just one nozzle base and try the different type of nozzle body options.
Material: Steel

Ref.	Description
ME-NZ-04-00	Modular nozzle body W:68 mm & H:18 mm. Must be mounted with ME-NZ-04-01 or ME-NA-04-02

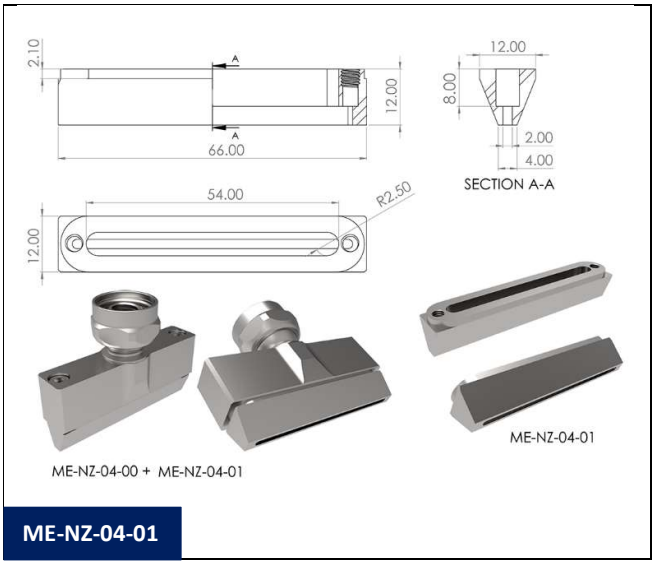


ME-NZ-04-00

ME-NZ-04 Fig. 2 (Slot nozzle body)

Flat slot nozzle body. The slot allows the coolant stream to cover a large area. Must be ordered with ME-NZ-04 Fig. 1 part.
Material: Steel.

Ref.	Description
ME-NZ-04-01	Modular nozzle outlet 0º slot W:60 mm & H:2 mm. Must be mounted with ME-NZ-04-00

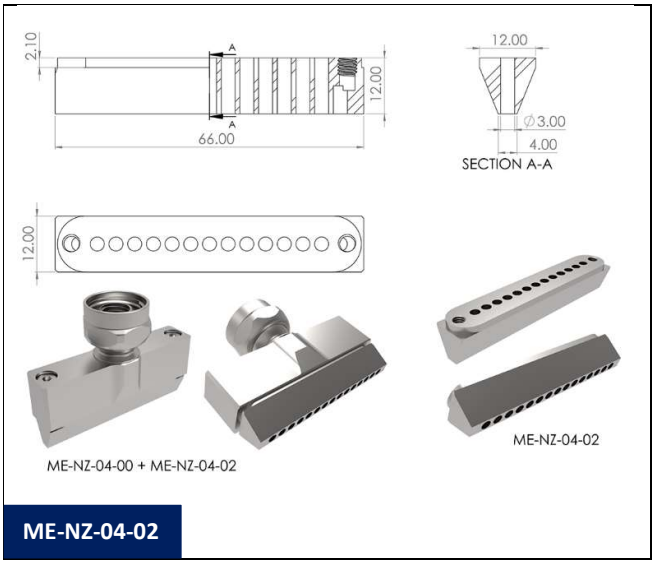


ME-NZ-04-01

ME-NZ-04 Fig. 3 (Multi-bore nozzle body)

Multi-bore nozzle body. For better coolant delivery in some applications. Must be ordered with ME-NZ-04 Fig. 1 part.
Material: Steel.

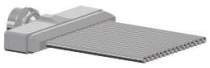
Ref.	Description
ME-NZ-04-02	Modular nozzle outlet 0º multibore DI:3 mm x 13. Must be mounted with ME-NZ-04-00



ME-NZ-04-02

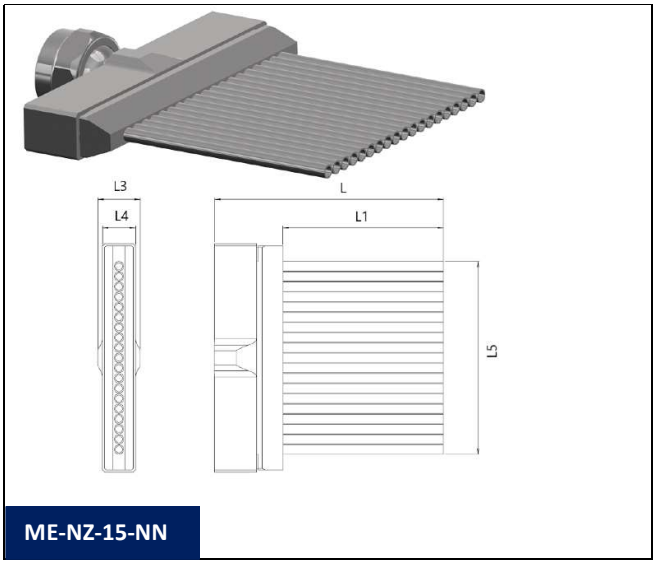
NOZZLES – GRINDING APPLICATIONS

ME-NZ-15 (Nozzle with outlet tubes)



Nozzle with tubes for minimum diffusion of the coolant stream. The design makes it possible to place the nozzle outlets at a minimum distance of the grinding wheel. Ideal to deliver coolant efficiently to the grinding wheel at a minimum distance.
Material: Steel

Ref.	Description
ME-NZ-15-45	Tube nozzle W:45 mm. 8 x Tubes: L:68 mm, ID:3 mm, OD:4 mm, W:30 mm.
ME-NZ-15-58	Tube nozzle W:58 mm. 10 x Tubes: L:68 mm, ID:3 mm, OD:4 mm, W:43 mm.
ME-NZ-15-67	Tube nozzle W:67 mm. 12 x Tubes: L:68 mm, ID:3 mm, OD:4 mm, W:51 mm.
ME-NZ-15-79	Tube nozzle W:79 mm. 15 x Tubes: L:68 mm, ID:3 mm, OD:4 mm, W:64 mm.
ME-NZ-15-88	Tube nozzle W:88 mm. 17 x Tubes: L:68 mm, ID:3 mm, OD:4 mm, W:73 mm.
ME-NZ-15-97	Tube nozzle W:97 mm. 19 x Tubes: L:68 mm, ID:3 mm, OD:4 mm, W:81 mm.



ME-NZ-15-NN

MEGA (ID: 10.5 mm) Ref.	Total width	Tubes width (L5)	Number of tubes	Tube OD	Tube ID	Tube Length (L1)	Total through coolant area	Total Length (L)	Total Height (L3)	Height (L4)
ME-NZ-15-45	45 mm	29.8 mm	8	4 mm	3 mm	68 mm	56.5 mm^2	96.7 mm	18 mm	14 mm
ME-NZ-15-58	57.9 mm	42.7 mm	10	4 mm	3 mm	68 mm	70.7 mm^2	96.7 mm	18 mm	14 mm
ME-NZ-15-67	66.5 mm	51.3 mm	12	4 mm	3 mm	68 mm	84.8 mm^2	96.7 mm	18 mm	14 mm
ME-NZ-15-79	79.4 mm	64.2 mm	15	4 mm	3 mm	68 mm	106 mm^2	96.7 mm	18 mm	14 mm
ME-NZ-15-88	88 mm	72.8 mm	17	4 mm	3 mm	68 mm	120.2 mm^2	96.7 mm	18 mm	14 mm
ME-NZ-15-97	96.6 mm	81.4 mm	19	4 mm	3 mm	68 mm	134.3 mm^2	96.7 mm	18 mm	14 mm

ME-NZ-05 (Flat slot nozzle)

Flat slot nozzle with a unique design that allows to regulate and create internal turbulence for an even coolant stream throughout the full length of the slot opening. The flat design allows to place the nozzle at a minimum distance from the grinding wheel.
The nozzles can be ordered with a straight slot (-S) or diverging slot with a small angle (15º) to increase the diffusion of the stream and cover a bigger area (-D).
The opening size of the slot can be ordered in a bigger dimension (different from the standard models) to increase the amount of flow through the slot.
Material: Steel.

Ref.	Description
STRAIGHT SLOT	
ME-NZ-05-50-S	Slot (straight) nozzle with flow regulation L:50 mm, Slot:42 x 2 mm
ME-NZ-05-60-S	Slot (straight) nozzle with flow regulation L:60 mm, Slot:52 x 1.7 mm
ME-NZ-05-70-S	Slot (straight) nozzle with flow regulation L:70 mm, Slot:62 x 1.4 mm
ME-NZ-05-80-S	Slot (straight) nozzle with flow regulation L:80 mm, Slot:72 x 1.2 mm
DIVERGING SLOT	
ME-NZ-05-50-D	Slot (diverging) nozzle with flow regulation L:50 mm, Slot:42 x 2 mm
ME-NZ-05-60-D	Slot (diverging) nozzle with flow regulation L:60 mm, Slot:52 x 1.7 mm
ME-NZ-05-70-D	Slot (diverging) nozzle with flow regulation L:70 mm, Slot:62 x 1.4 mm
ME-NZ-05-80-D	Slot (diverging) nozzle with flow regulation L:80 mm, Slot:72 x 1.2 mm

Selection: LL-NZ-05-NNN-L-(NN.N)
① ② ③ ④ ⑤

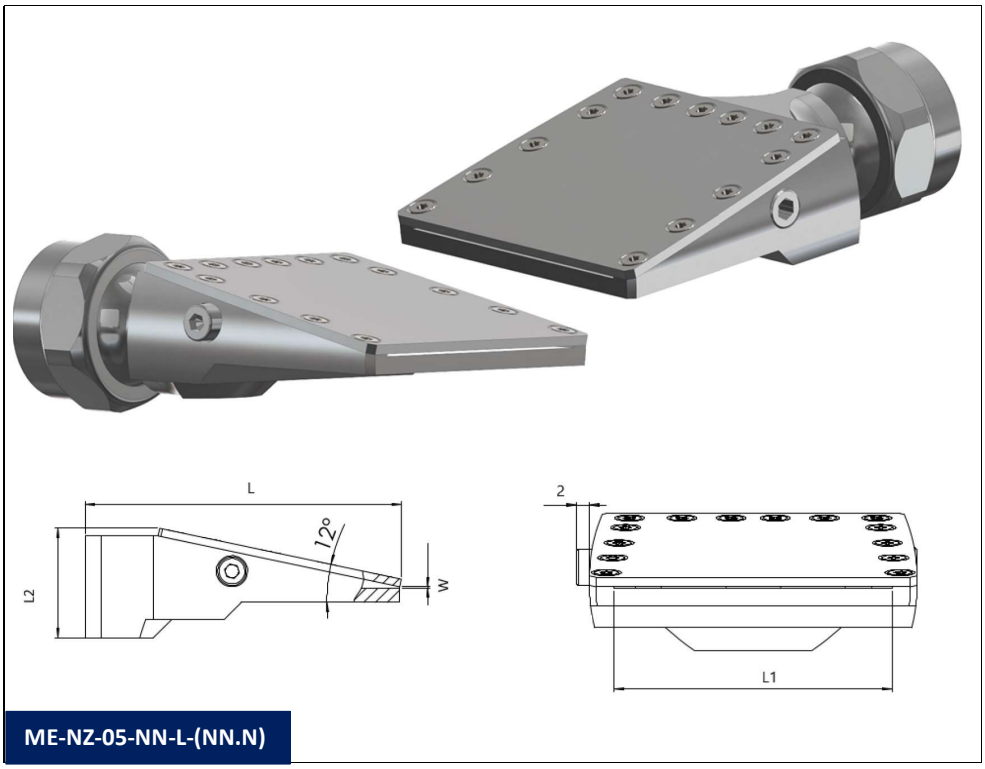
① **Family flow size:** LL
HE: Hecto
ME: Mega
GI: Giga

② **Basic denomination of Nozzle:** -NZ-05

③ **Total nozzle width according to standard dimensions:** NNN

④ **Type of slot:** -L
-S: Straight slot.
-D: Diverging slot with angle opening for a wider coolant stream.

⑤ **Slot opening (W):** (-NN.N)
-Blank: Standard
-NN.N: Special dimension according to customer request. Minimum and maximum according to range of dimension from standard slot opening of each family size.



ME-NZ-05-NN-L-(NN.N)

Instructions to adjust the internal diffuser:

① Loosen the Allen screw which protrudes from the nozzle side.

② Adjust the internal diffuser to regulate the flow turbulence by turning the Allen screw which is integrated in the nozzle side.

③ Tight again the Allen screw described in item ① to fix the position of the internal diffuser.

***Dimensions are subject to changes.**

MEGA (ID: 10.5 mm)

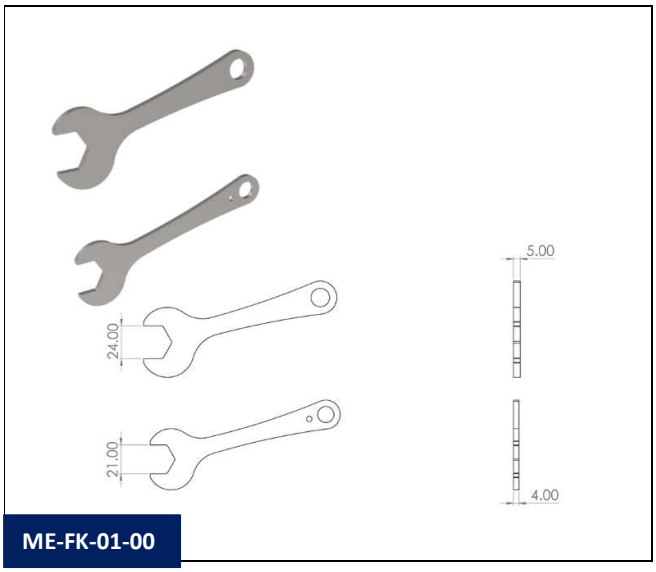
Ref.	Total width	Slot width (L1)	Slot opening (W)	Slot area	Type of slot	Total Length (L)	Total Height (L2)
ME-NZ-05-50-S	50 mm	42.4 mm^2	2.0 mm	84.8 mm^2	Straight	60 mm	21 mm
ME-NZ-05-60-S	60 mm	52.4 mm^2	1.7 mm	89.1 mm^2	Straight	60 mm	21 mm
ME-NZ-05-70-S	70 mm	62.4 mm^2	1.4 mm	87,4 mm^2	Straight	60 mm	21 mm
ME-NZ-05-80-S	80 mm	72.4 mm^2	1.2 mm	86.9 mm^2	Straight	60 mm	21 mm
ME-NZ-05-50-D	50 mm	42.4 mm^2	2.0 mm	84.8 mm^2	Diverging	60 mm	21 mm
ME-NZ-05-60-D	60 mm	52.4 mm^2	1.7 mm	89.1 mm^2	Diverging	60 mm	21 mm
ME-NZ-05-70-D	70 mm	62.4 mm^2	1.4 mm	87,4 mm^2	Diverging	60 mm	21 mm
ME-NZ-05-80-D	80 mm	72.4 mm^2	1.2 mm	86.9 mm^2	Diverging	60 mm	21 mm

FASTENING KEYS FOR MEGA SYSTEM

ME-FK-01 (SW 21 and SW 24)

Special wrenches for fastening the *MEGA articul*ated system.
Maximum torque for locking the parts of the system: 28 Nm

Ref.	Description
ME-FK-01-00	Wrenches for fastening the 2 hexagons used in the MEGA program. SW21 & SW24.



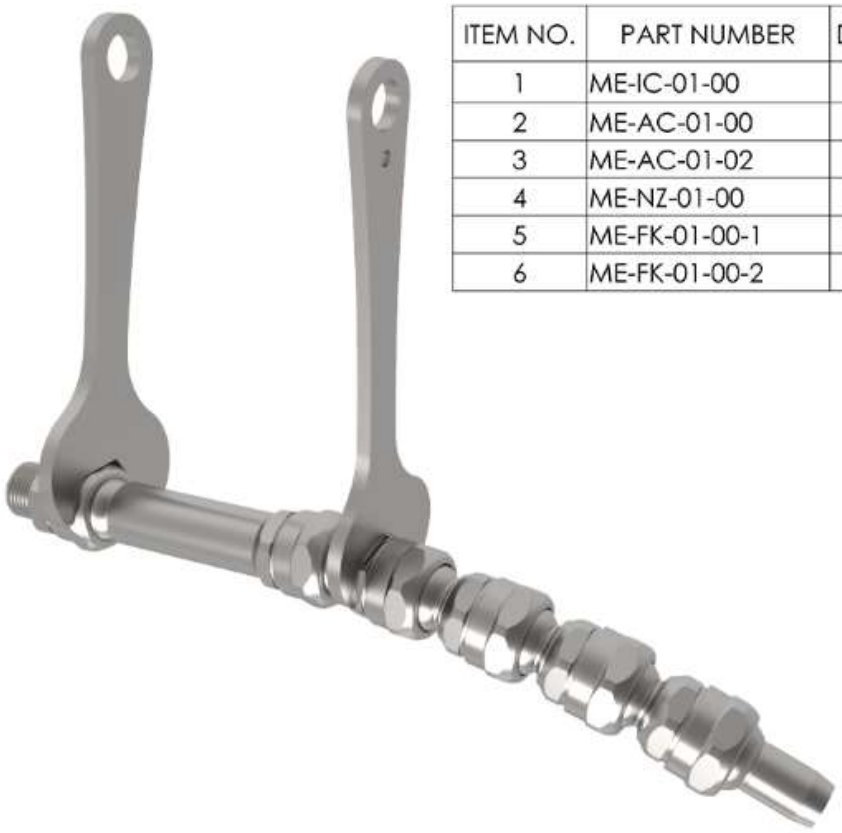
ME-FK-01-00

STARTER KITS

ME-SK-01-00 (Kit single outlet MEGA)

Set of components to start and become familiar with the SCS Articulated Coolant Distribution System MEGA program. Basic set of components delivered in a basic kit for the most typical applications.

Ref.	Description
ME-SK-01-00	**Kit Single Outlet MEGA:** **For general cooling with a single outlet L=260 mm.** **Weight: 440 g.** ***Initial Connection:*** 1 unit ME-IC-01-00 BSPP 3/8"(M) to articulated connection MEGA. ***Articulated connection:*** 5 units ME-AC-01-00 Articulated connection MEGA L:28.5 mm 1 unit ME-AC-01-01 Articulated connection MEGA L:78.5 mm ***Coolant nozzles:*** 1 unit ME-NZ-01-00 Straight nozzle. ID:10.5 mm & L:27 mm ***Fastening keys for the articulated system:*** 1 unit ME-FK-01-00 Wrenches for fastening the 2 hexagons used in the MEGA program. SW21 & SW24.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	ME-IC-01-00		1
2	ME-AC-01-00		5
3	ME-AC-01-02		1
4	ME-NZ-01-00		1
5	ME-FK-01-00-1		1
6	ME-FK-01-00-2		1

ME-SK-01-00

GIGA (16 mm) PROGRAM

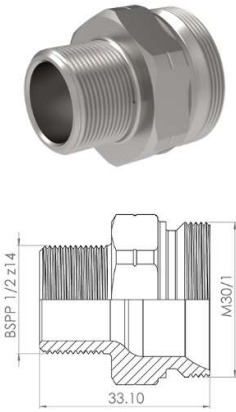
The internal through hole of the GIGA program is 16 mm and is ideal for the distribution of air and refrigerant (oil or emulsion) in medium and large-sized machines such as CNC lathes, machining centers or grinding machines.
Maximum torque for locking the parts of the system: 40 Nm
Maximum pressure: 80 Bar (1,160 psi)

INITIAL CONNECTION:

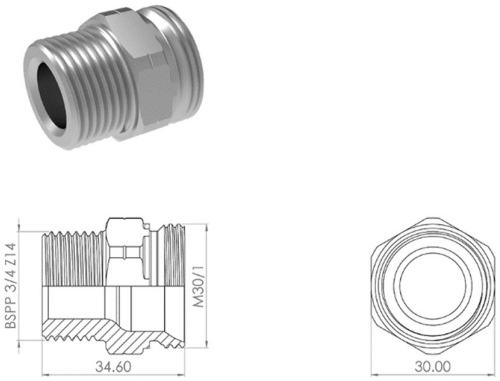
GI-IC-01 Fig. 1 (Male to GIGA)

Male thread connection elements to connect to the machine-tool or other SCS coolant distribution programs. ID:16 mm.
Material: Steel

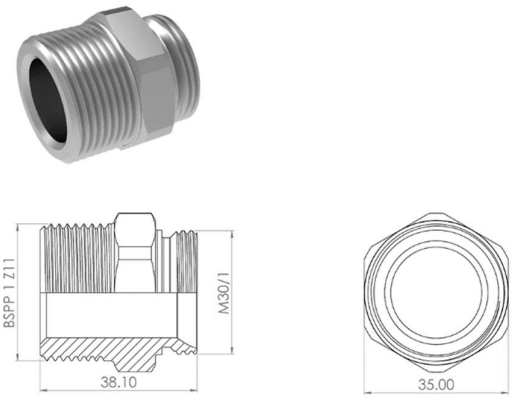
Ref.	Description
GI-IC-01-00	BSPP 1/2"(M) to articulated connection GIGA.
GI-IC-01-01	BSPP 3/4"(M) to articulated connection GIGA.
GI-IC-01-02	BSPP 1"(M) to articulated connection GIGA.
GI-IC-01-06	BSPT 1/2"(M) to articulated connection GIGA.
GI-IC-01-07	BSPT 3/4"(M) to articulated connection GIGA.
GI-IC-01-03	NPT 1/2"(M) to articulated connection GIGA.
GI-IC-01-04	NPT 3/4"(M) to articulated connection GIGA.
GI-IC-01-05	NPT 1"(M) to articulated connection GIGA.



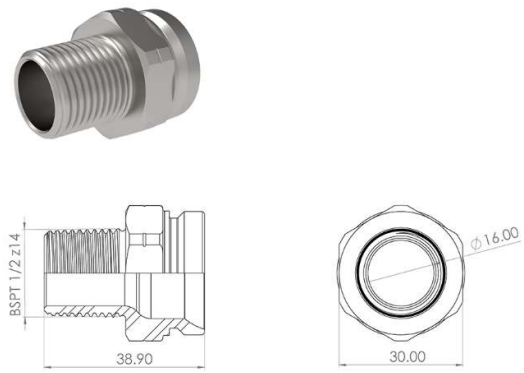
GI-IC-01-00



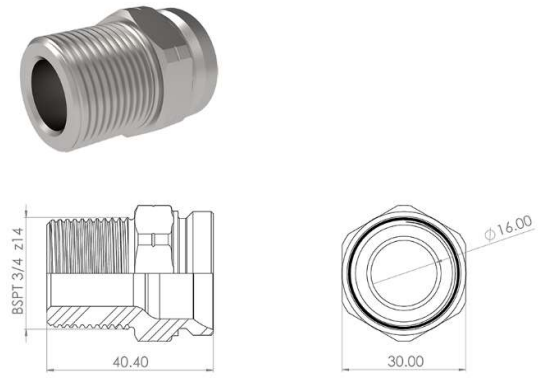
GI-IC-01-01



GI-IC-01-02



GI-IC-01-06



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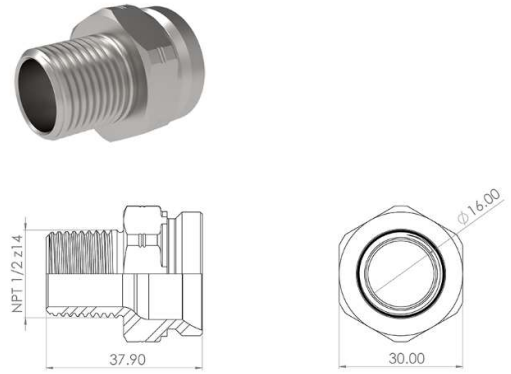
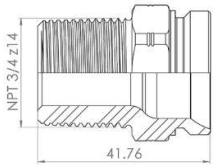
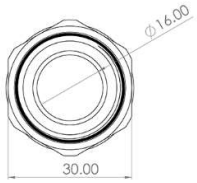


GI-IC-01-03





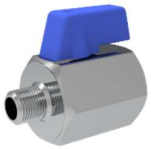
GI-IC-01-04

Drawing not available

GI-IC-01-05

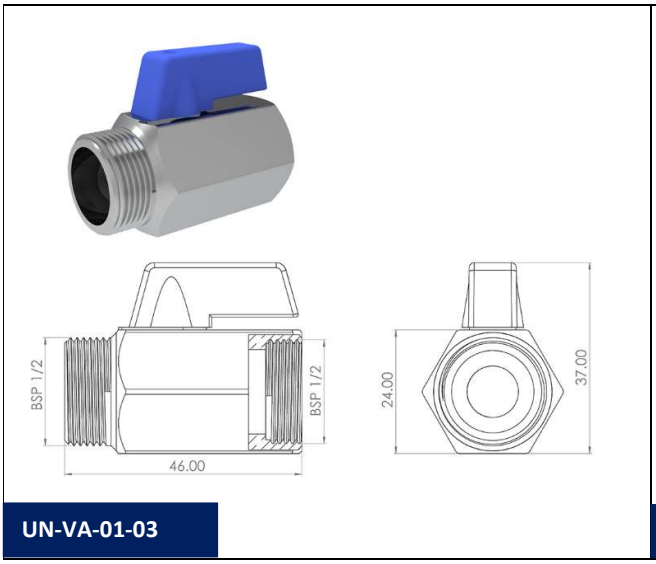
BALL VALVES

UN-VA-01 (PN10 – Male to Female)

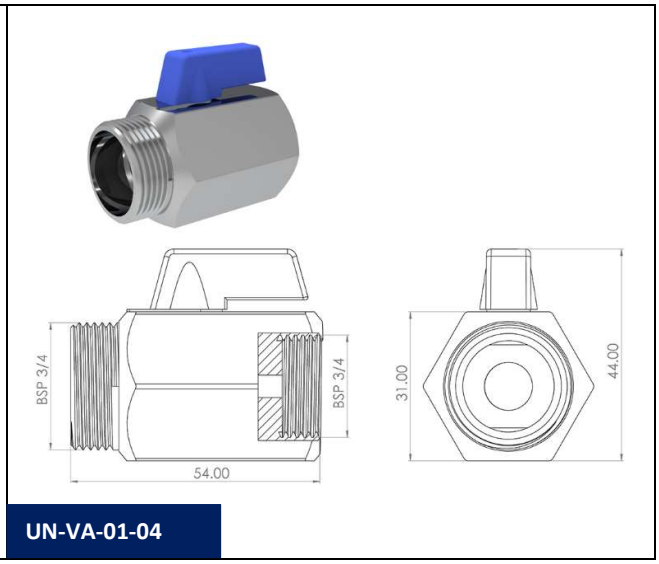


Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 10 bar (145 psi).
Material: Chrome plated brass.

Ref.	Description
UN-VA-01-03	Closing valve PN10, BSPP 1/2"(M) and BSPP 1/2"(F) chromed-plated brass.
UN-VA-01-04	Closing valve PN10, BSPP 3/4"(M) and BSPP 3/4"(F) chromed-plated brass.
UN-VA-02-03	Closing valve PN63, BSPP 1/2"(M) and BSPP 1/2"(F) AISI-316
UN-VA-02-04	Closing valve PN63, BSPP 3/4"(M) and BSPP 3/4"(F) AISI-316
UN-VA-02-05	Closing valve PN63, BSPP 1"(M) and BSPP 1"(F) AISI-316



UN-VA-01-03

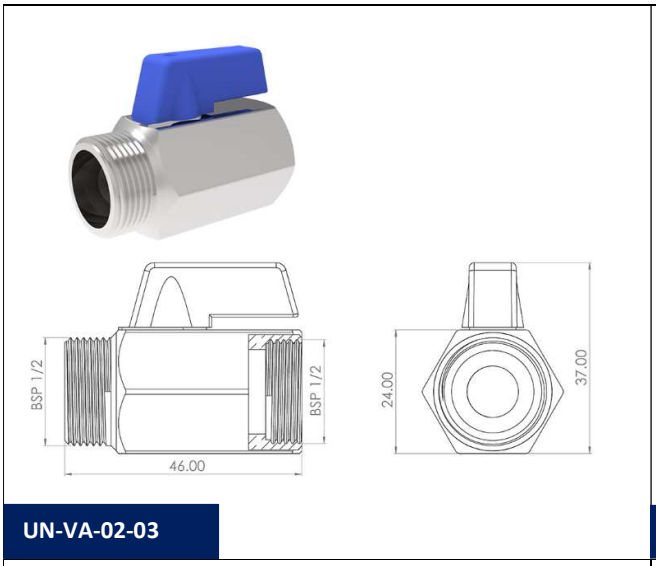


UN-VA-01-04

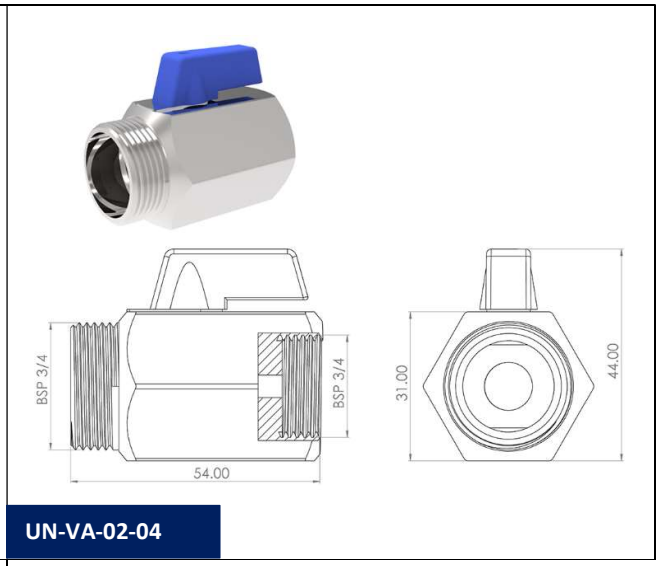
UN-VA-02 (PN63 – Male to Female)

Miniature ball valves for shut-off or control of the coolant flow. To be installed at the machine-tool coolant outlet.
Maximum pressure: 63 bar (914 psi).
Material: Stainless steel AISI-316

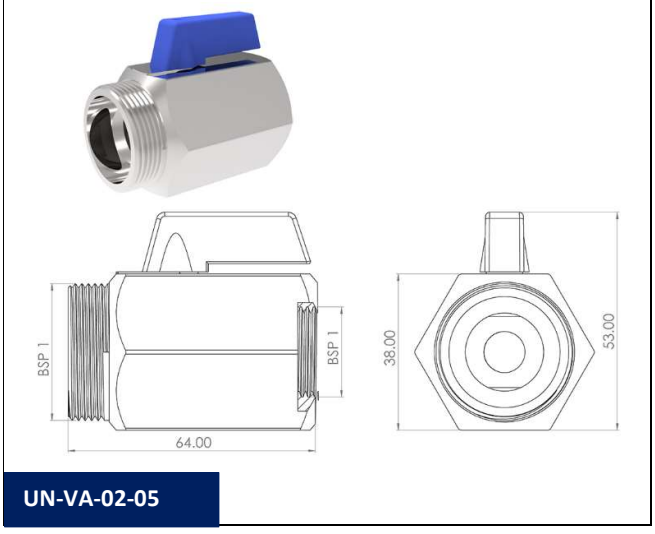
Ref.	Description
UN-VA-02-03	Closing valve PN63, BSPP 1/2"(M) and BSPP 1/2"(F) AISI-316
UN-VA-02-04	Closing valve PN63, BSPP 3/4"(M) and BSPP 3/4"(F) AISI-316
UN-VA-02-05	Closing valve PN63, BSPP 1"(M) and BSPP 1"(F) AISI-316



UN-VA-02-03



UN-VA-02-04



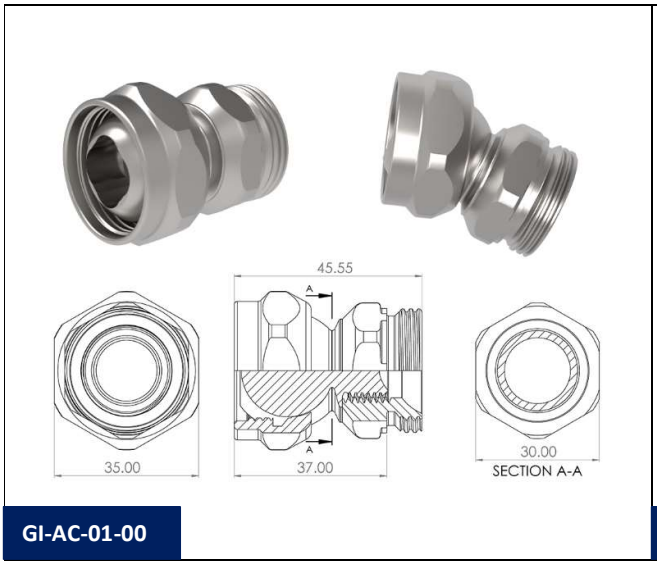
UN-VA-02-05

ARTICULATED CONNECTIONS

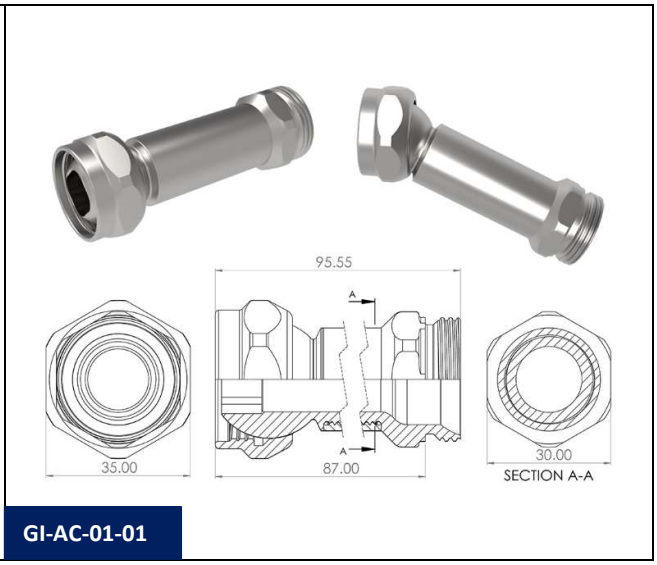
GI-AC-01 (Straight connection)

Basic straight articulated elements which connect to an initial connection, to another articulated connection, or to a nozzle. Swiveling ±25º. ID:16 mm.
Material: Steel

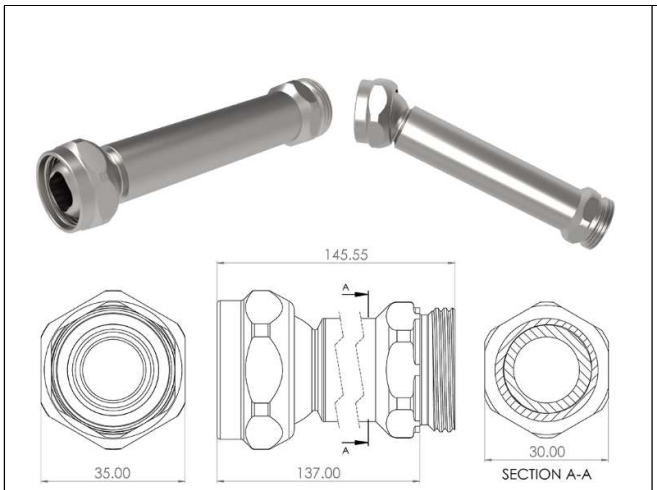
Ref.	Description
GI-AC-01-00	Articulated connection GIGA L:37 mm
GI-AC-01-01	Articulated connection GIGA L:87 mm
GI-AC-01-02	Articulated connection GIGA L:137 mm
GI-AC-01-03	Articulated connection GIGA L:187 mm
GI-AC-01-04	Articulated connection GIGA L:237 mm



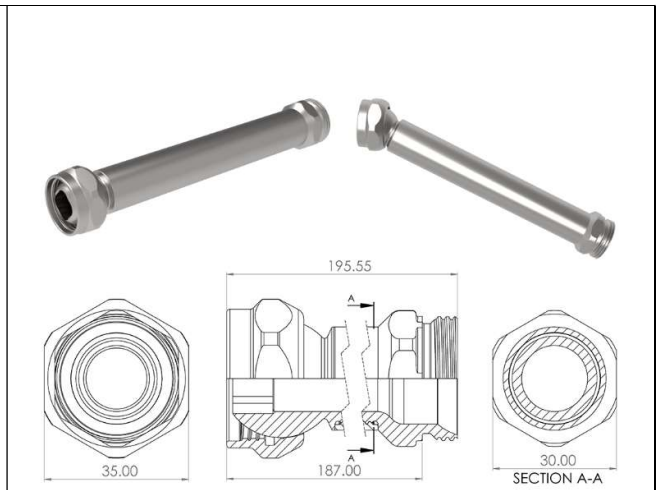
GI-AC-01-00



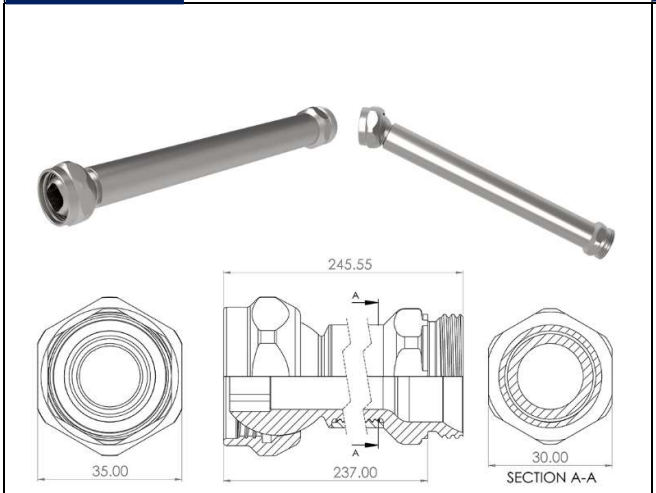
GI-AC-01-01



GI-AC-01-02



GI-AC-01-03

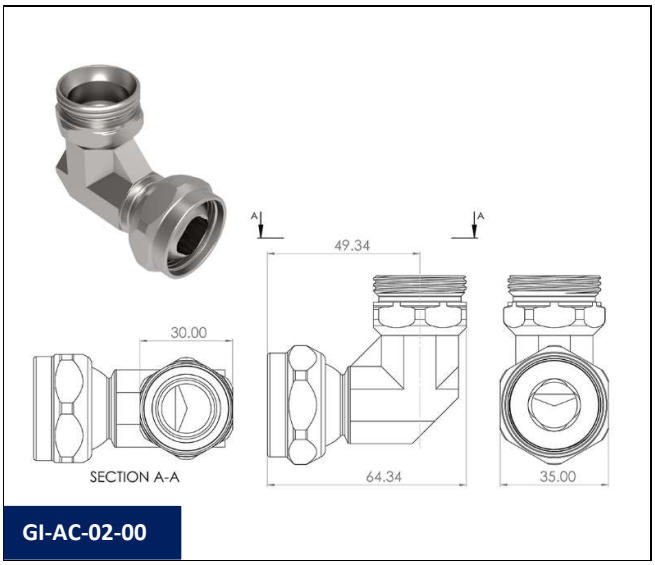


GI-AC-01-04

GI-AC-02 (90º connection)

90º articulated elements which connect to an initial connection, to a straight connection or to a nozzle.
Swiveling ±25º. ID:16 mm.
Material: Steel

Ref.	Description
GI-AC-02-00	Articulated connection to 90º GIGA



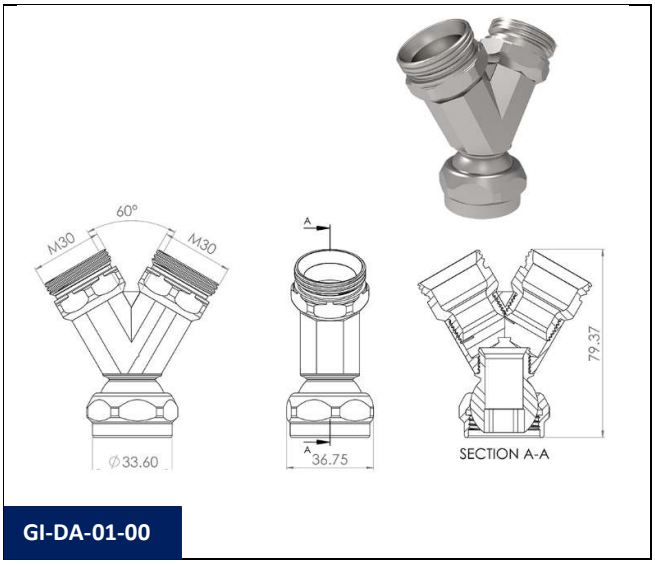
GI-AC-02-00

DISTRIBUTORS AND ADAPTORS

ME-DA-01 (60º Split distributor)

Coolant split distributor 60º (“Y” type). Expansion of articulated lines.
Material: Steel

Ref.	Description
GI-DA-01-00	“Y” distributor to articulated connection GIGA



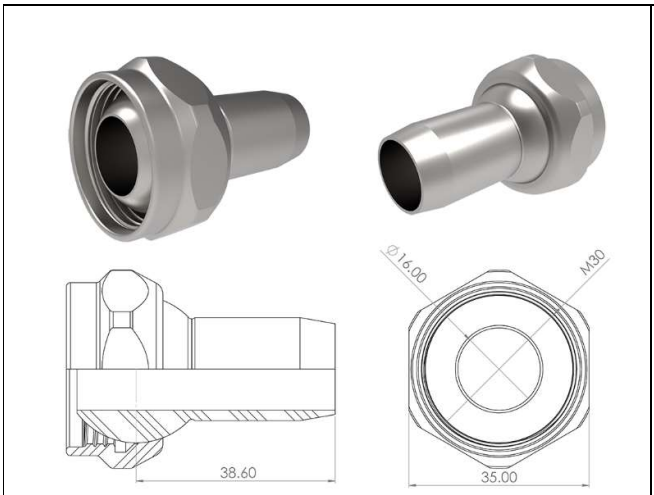
GI-DA-01-00

NOZZLES – GENERAL APPLICATIONS

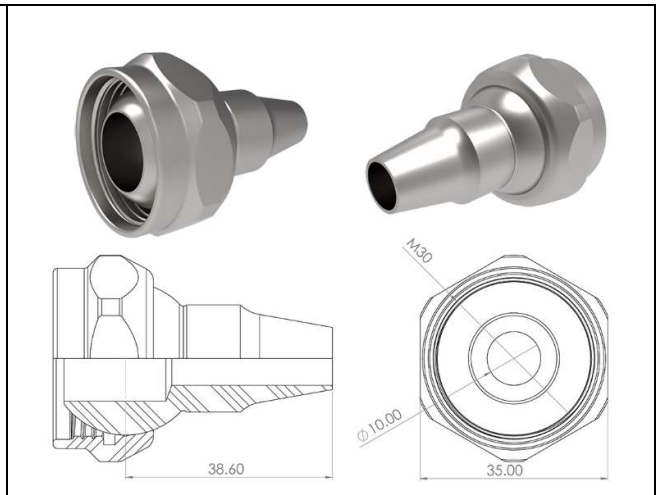
GI-NZ-01 Fig. 1 (Straight short nozzle)

Straight short nozzles with different outlet diameters to meet different coolant delivery requirements.
Material: Steel

Ref.	Description
GI-NZ-01-00	Straight nozzle. ID:16 mm & L:38.5 mm
GI-NZ-01-01	Straight nozzle. ID:10 mm & L:38.5



GI-NZ-01-00

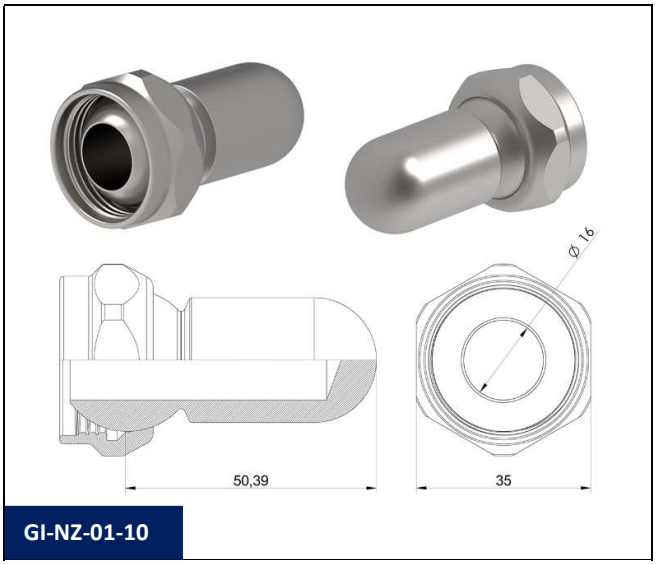


GI-NZ-01-01

GI-NZ-01 Fig. 2 (Blind short nozzle)

Short nozzle prepared to be drilled by the end-user to the required outlet diameter
Material: Steel

Ref.	Description
GI-NZ-01-10	Straight nozzle. ID:0 mm & L:50.4 mm

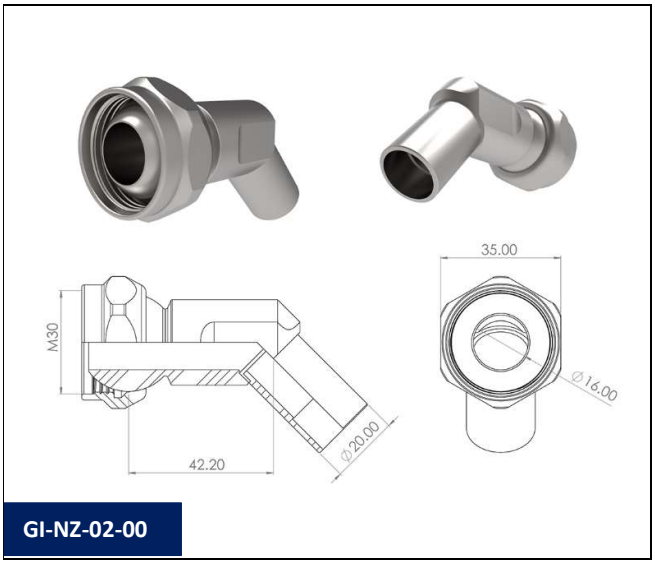


GI-NZ-01-10

GI-NZ-02 (45º nozzle with tube)

Nozzle with 45º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
GI-NZ-02-00	Nozzle 45º. ID:16 mm & L:38.5 mm

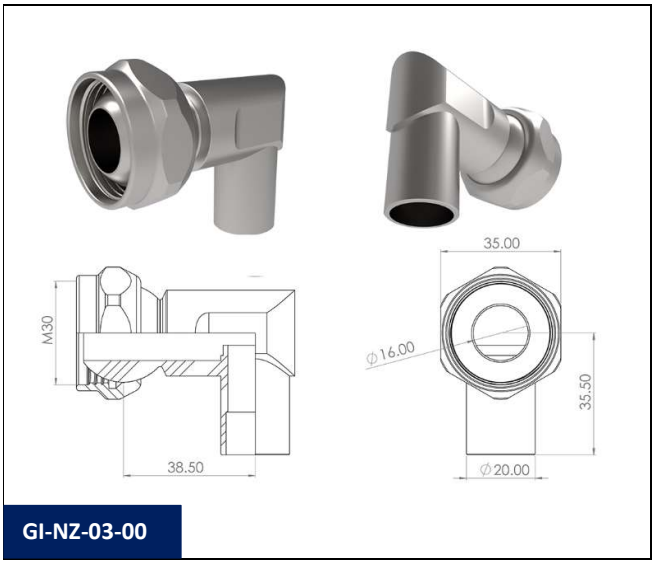


GI-NZ-02-00

GI-NZ-03 Fig. 1 (90º nozzle with tube)

Nozzle with 90º outlet tube for reduced coolant diffusion for angled coolant delivery requirements.
Material: Steel

Ref.	Description
GI-NZ-03-00	Nozzle 90º. ID:16 mm & L:38.5 mm

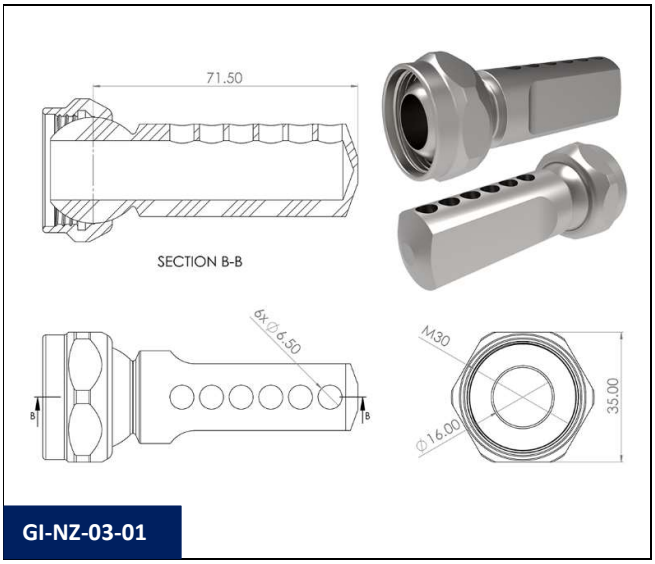


GI-NZ-03-00

GI-NZ-03 Fig. 2 (90º simple nozzle with 6 outlet holes)

Nozzle with 6 outlet holes at 90º to meet different angled coolant delivery requirements. Ideal to deliver coolant at different sections of a drill or a mill or for grinding applications.
Material: Steel

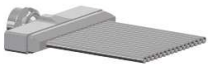
Ref.	Description
GI-NZ-03-01	Nozzle 6 outlets at 90º. ID:6.5 mm & L:78 mm



GI-NZ-03-01

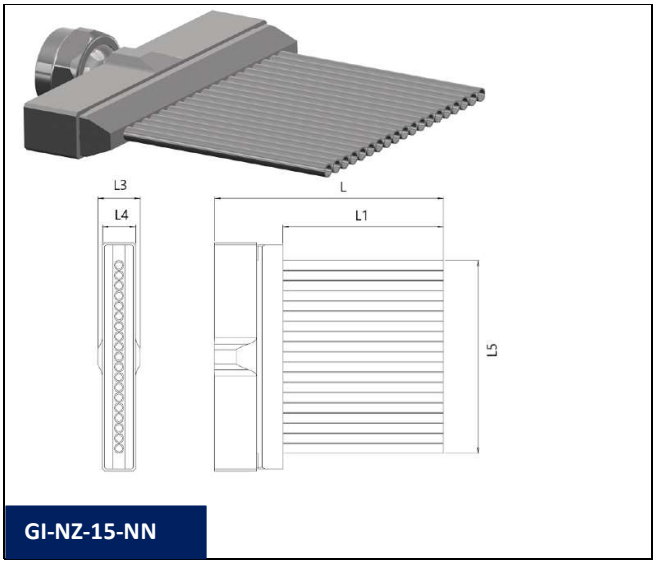
NOZZLES – GRINDING APPLICATIONS

GI-NZ-15 (Nozzle with outlet tubes)



Nozzle with tubes for minimum diffusion of the coolant stream. The design makes it possible to place the nozzle outlets at a minimum distance of the grinding wheel. Ideal to deliver coolant efficiently to the grinding wheel at a minimum distance.
Material: Steel

Ref.	Description
GI-NZ-15-75	Tube nozzle W:75 mm. 11 x Tubes: L:82 mm, ID:4 mm, OD:5 mm, W:58 mm.
GI-NZ-15-86	Tube nozzle W:86 mm. 13 x Tubes: L:82 mm, ID:4 mm, OD:5 mm, W:69 mm.
GI-NZ-15-96	Tube nozzle W:96 mm. 15 x Tubes: L:82 mm, ID:4 mm, OD:5 mm, W:79 mm.
GI-NZ-15-107	Tube nozzle W:107 mm. 17 x Tubes: L:82 mm, ID:4 mm, OD:5 mm, W:90 mm.
GI-NZ-15-117	Tube nozzle W:117 mm. 19 x Tubes: L:82 mm, ID:4 mm, OD:5 mm, W:100 mm.



GI-NZ-15-NN

GIGA (ID: 16 mm)										
Ref.	Total width	Tubes width (L5)	Number of tubes	Tube OD	Tube ID	Tube Length (L1)	Total through coolant area	Total Length (L)	Total Height (L3)	Height (L4)
GI-NZ-15-75	75 mm	58 mm	11	5 mm	4 mm	82 mm	138.2 mm^2	117 mm	26 mm	20 mm
GI-NZ-15-86	85.6 mm	68.6 mm	13	5 mm	4 mm	82 mm	163.4 mm^2	117 mm	26 mm	20 mm
GI-NZ-15-96	96.2 mm	79.2 mm	15	5 mm	4 mm	82 mm	188.5 mm^2	117 mm	26 mm	20 mm
GI-NZ-15-107	106.8 mm	89.8 mm	17	5 mm	4 mm	82 mm	213.6 mm^2	117 mm	26 mm	20 mm
GI-NZ-15-117	117.4 mm	100.4 mm	19	5 mm	4 mm	82 mm	238.8 mm^2	117 mm	26 mm	20 mm

GI-NZ-05 (Flat slot nozzle)

Flat slot nozzle with a unique design that allows to regulate and create internal turbulence for an even coolant stream throughout the full length of the slot opening. The flat design allows to place the nozzle at a minimum distance from the grinding wheel.
The nozzles can be ordered with a straight slot (-S) or diverging slot with a small angle (15º) to increase the diffusion of the stream and cover a bigger area (-D).
The opening size of the slot can be ordered in a bigger dimension (different from the standard models) to increase the amount of flow through the slot.
Material: Steel.

Ref.	Description
STRAIGHT SLOT	
GI-NZ-05-80-S	Slot (straight) nozzle with flow regulation L:80 mm, Slot:72 x 2.8 mm
GI-NZ-05-90-S	Slot (straight) nozzle with flow regulation L:90 mm, Slot:82 x 2.4 mm
GI-NZ-05-100-S	Slot (straight) nozzle with flow regulation L:100 mm, Slot:92 x 2.2 mm
DIVERGING SLOT	
GI-NZ-05-80-D	Slot (diverging) nozzle with flow regulation L:80 mm, Slot:72 x 2.8 mm
GI-NZ-05-90-D	Slot (diverging) nozzle with flow regulation L:90 mm, Slot:82 x 2.4 mm
GI-NZ-05-100-D	Slot (diverging) nozzle with flow regulation L:100 mm, Slot:92 x 2.2 mm

Selection: LL-NZ-05-NNN-L-(NN.N)
① ② ③ ④ ⑤

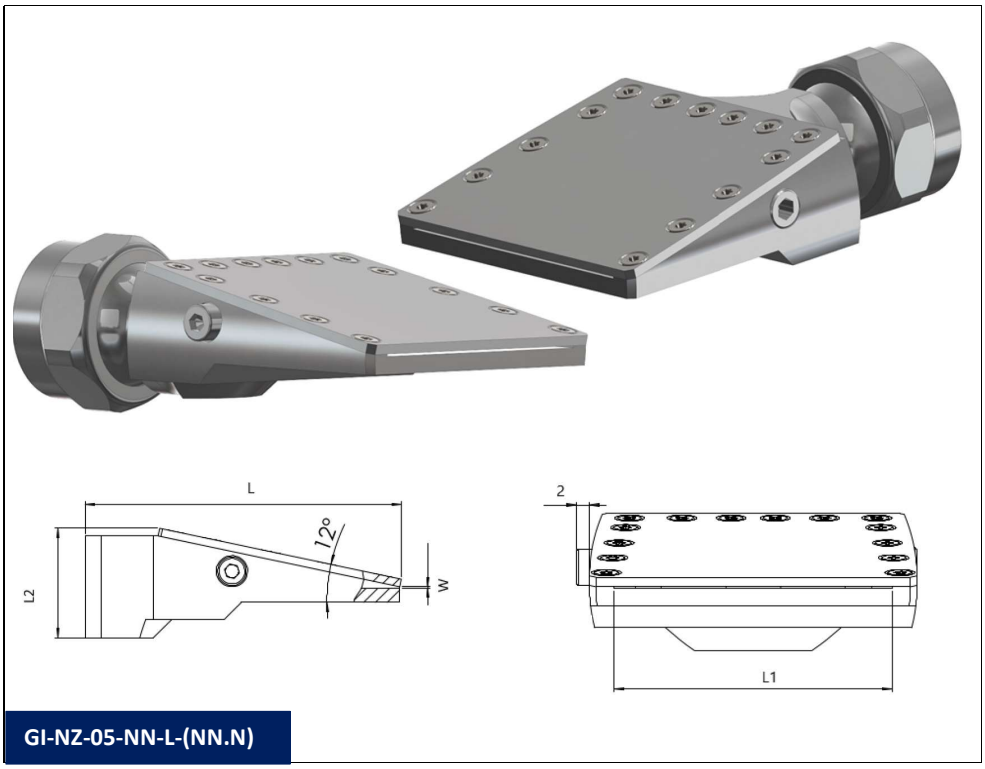
① **Family flow size:** LL
HE: Hecto
ME: Mega
GI: Giga

② **Basic denomination of Nozzle:** -NZ-05

③ **Total nozzle width according to standard dimensions:** NNN

④ **Type of slot:** -L
-S: Straight slot.
-D: Diverging slot with angle opening for a wider coolant stream.

⑤ **Slot opening (W):** (-NN.N)
-Blank: Standard
-NN.N: Special dimension according to customer request. Minimum and maximum according to range of dimension from standard slot opening of each family size.



GI-NZ-05-NN-L-(NN.N)

Instructions to adjust the internal diffuser:

① Loosen the Allen screw which protrudes from the nozzle side.

② Adjust the internal diffuser to regulate the flow turbulence by turning the Allen screw which is integrated in the nozzle side.

③ Tight again the Allen screw described in item ① to fix the position of the internal diffuser.

***Dimensions are subject to changes.**

GIGA (ID: 16 mm)

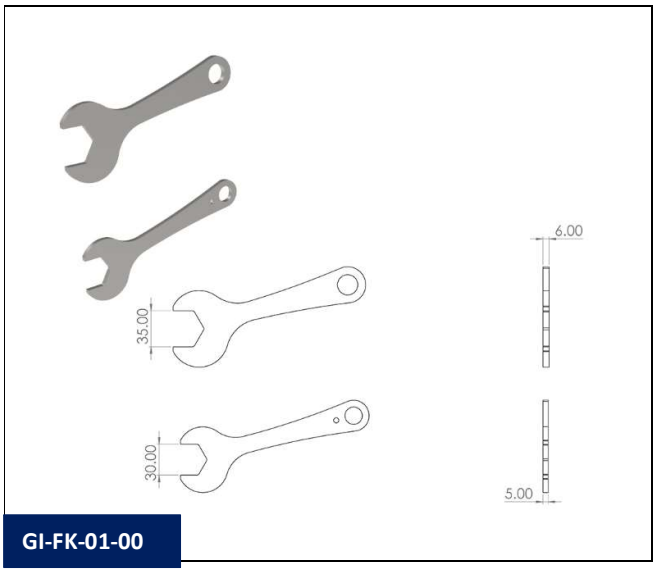
Ref.	Total width	Slot width (L1)	Slot opening (W)	Slot area	Type of slot	Total Length (L)	Total Height (L2)
GI-NZ-05-80-S	80 mm	72.4 mm^2	2.8 mm	202.7 mm^2	Straight	60 mm	28 mm
GI-NZ-05-90-S	90 mm	82.4 mm^2	2.4 mm	197.8 mm^2	Straight	60 mm	28 mm
GI-NZ-05-100-S	100 mm	92.4 mm^2	2.2 mm	203.3 mm^2	Straight	60 mm	28 mm
GI-NZ-05-80-D	80 mm	72.4 mm^2	2.8 mm	202.7 mm^2	Diverging	60 mm	28 mm
GI-NZ-05-90-D	90 mm	82.4 mm^2	2.4 mm	197.8 mm^2	Diverging	60 mm	28 mm
GI-NZ-05-100-D	100 mm	92.4 mm^2	2.2 mm	203.3 mm^2	Diverging	60 mm	28 mm

FASTENING KEYS FOR GIGA SYSTEM

GI-FK-01 (SW 30 and SW 35)

Special wrenches for fastening the *GIGA articulated* system.
Maximum torque for locking the parts of the system: 40 Nm

Ref.	Description
GI-FK-01-00	Wrenches for fastening the 2 hexagons used in the GIGA program. SW30 & SW35.



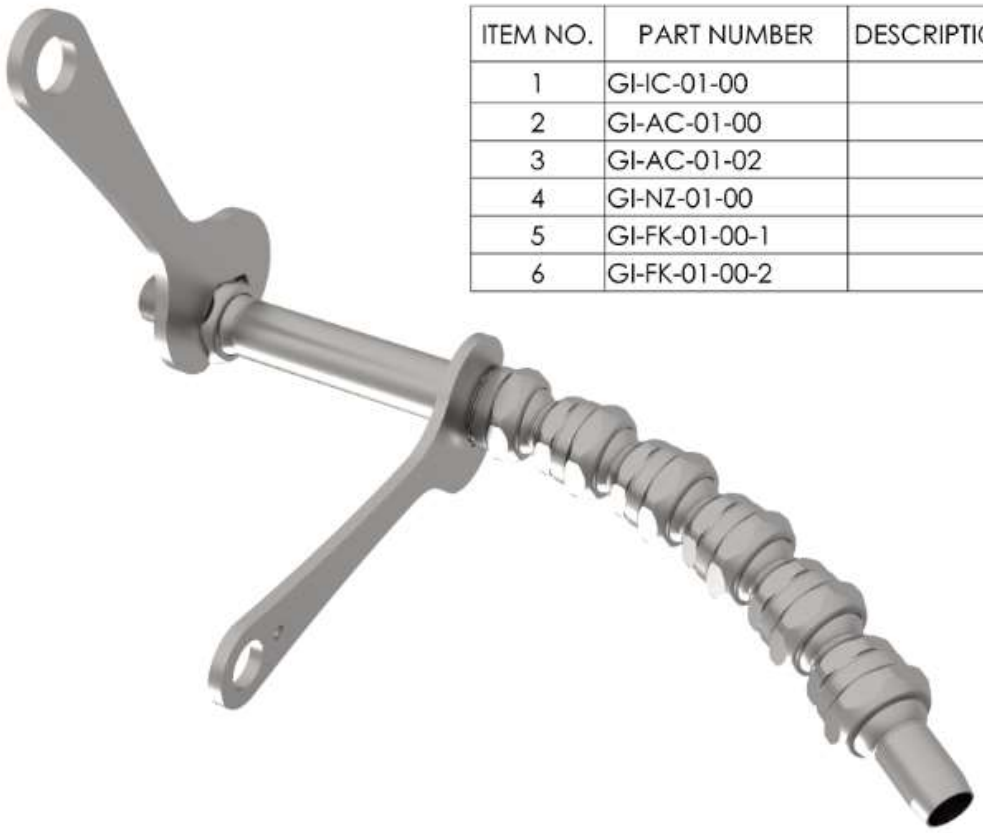
GI-FK-01-00

STARTER KITS

GI-SK-01-00 (Kit single outlet GIGA)

Set of components to start and become familiar with the SCS Articulated Coolant Distribution System GIGA program. Basic set of components delivered in a basic kit for the most typical applications.

Ref.	Description
GI-SK-01-00	**Kit Single Outlet GIGA:** **For general cooling with a single outlet L=330 mm.** **Weight: 1610 g.** ***Initial Connection:*** 1 unit GI-IC-01-00 BSPP 1/2"(M) to articulated connection GIGA. ***Articulated connection:*** 5 units GI-AC-01-00 Articulated connection GIGA L:37 mm 1 unit GI-AC-01-01 Articulated connection GIGA L:87 mm ***Coolant nozzles:*** 1 unit GI-NZ-01-00 Straight nozzle. ID:16 mm & L:38.5 mm ***Fastening keys for the articulated system:*** 1 unit GI-FK-01-00 Wrenches for fastening the 2 hexagons used in the GIGA program. SW30 & SW35.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GI-IC-01-00		1
2	GI-AC-01-00		5
3	GI-AC-01-02		1
4	GI-NZ-01-00		1
5	GI-FK-01-00-1		1
6	GI-FK-01-00-2		1

GI-SK-01-00

GI-SK-01-01 (Kit single outlet GIGA Short)

Set of components to start and become familiar with the SCS Articulated Coolant Distribution System GIGA program. Basic set of components delivered in a basic kit for the most typical applications.

Ref.	Description
GI-SK-01-01	**Kit Single Outlet GIGA:** **For general cooling with a single outlet L=206 mm.** **Weight: 1248 g.** ***Initial Connection:*** 1 unit GI-IC-01-00 BSPP 1/2"(M) to articulated connection GIGA. ***Articulated connection:*** 3 units GI-AC-01-00 Articulated connection GIGA L:37 mm 1 unit GI-AC-01-01 Articulated connection GIGA L:87 mm ***Coolant nozzles:*** 1 unit GI-NZ-01-00 Straight nozzle. ID:16 mm & L:38.5 mm ***Fastening keys for the articulated system:*** 1 unit GI-FK-01-00 Wrenches for fastening the 2 hexagons used in the GIGA program. SW30 & SW35.

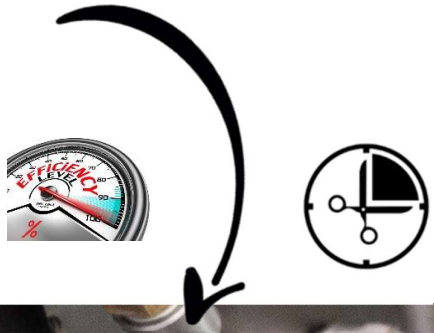
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GI-IC-01-00		1
2	GI-AC-01-00		3
3	GI-AC-01-02		1
4	GI-NZ-01-00		1
5	GI-FK-01-00-1		1
6	GI-FK-01-00-2		1

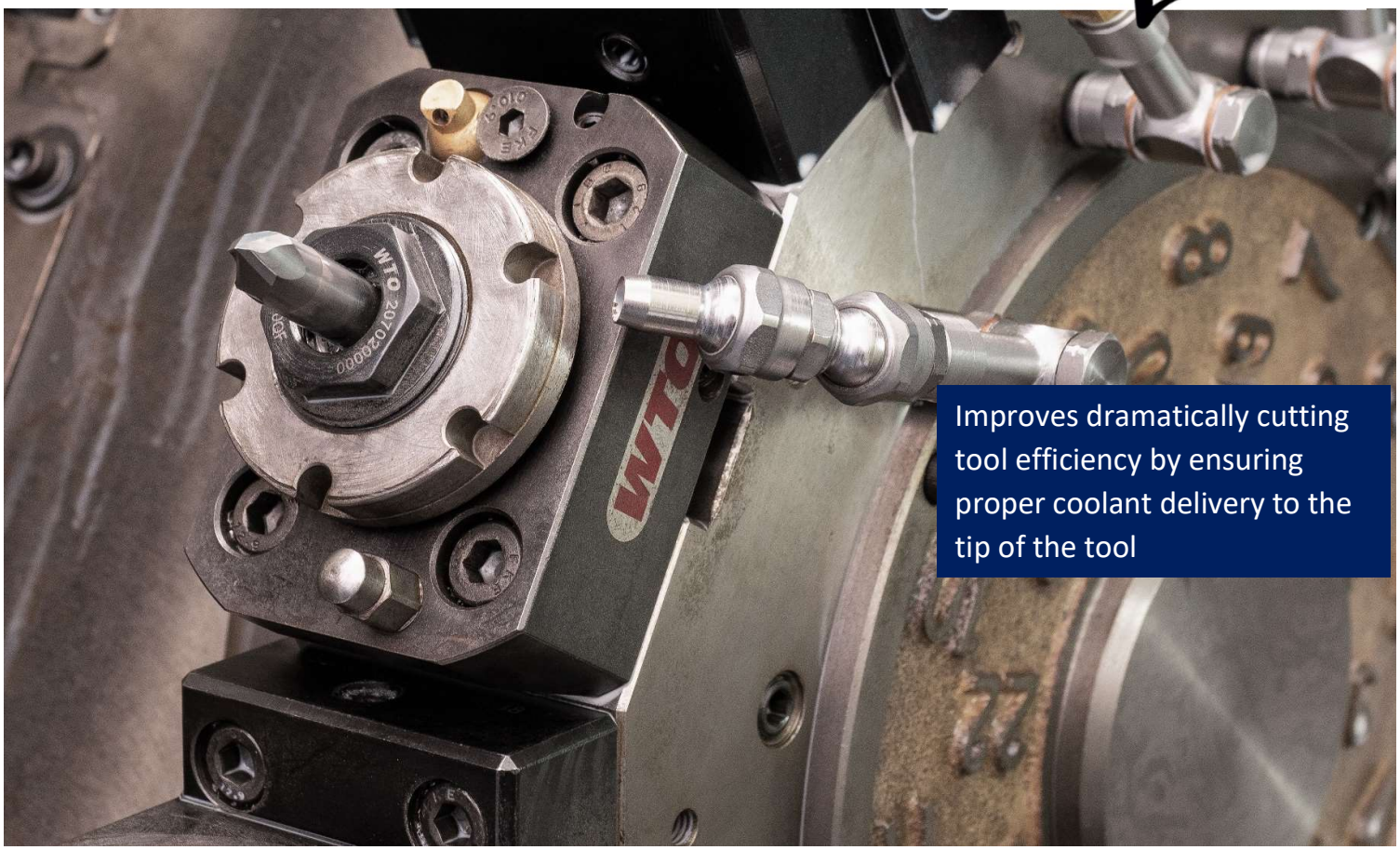
GI-SK-01-01

MACHINE KITS. PRE-ASSEMBLED PARTS READY TO INSTALL IN MACHINES OR TOOL HOLDERS IMPROVING REALIABILITY AND EFFICIENCY OF COOLANT DELIVERY

Complete sets of articulated steel tubes to substitute traditional plastic tubes installed in the machine which cannot withstand coolant pressure. Pre-defined kits for top selling machines and possibility of customized solutions with basic information and a photograph of existing plastic tubing to substitute.

Kits for turret disc mounting to improve cooling to the tool holders and kits for tool holders, both driven and fixed, with ball type adaptors and complete range of nozzles. No need for copper tubes with inconsistent bending that blocks the refrigerant and non-existing nozzle.

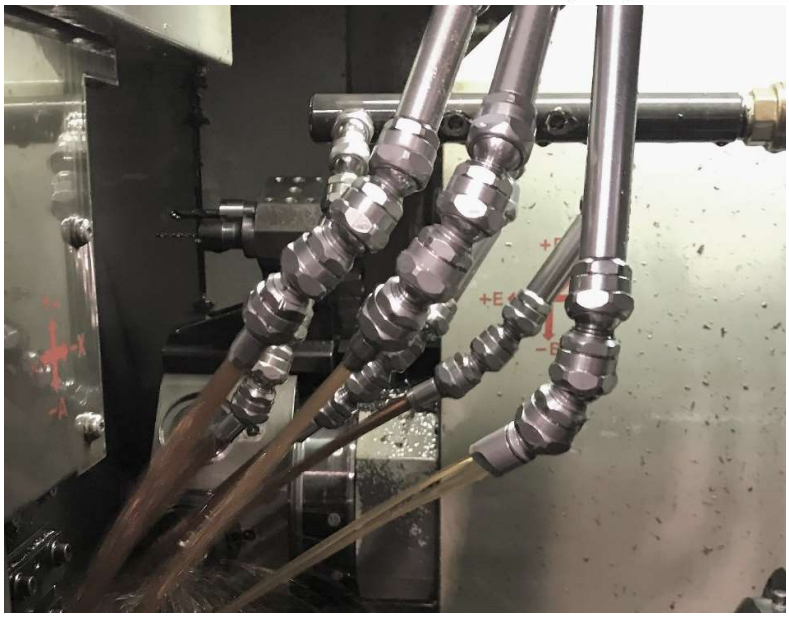




Improves dramatically cutting tool efficiency by ensuring proper coolant delivery to the tip of the tool

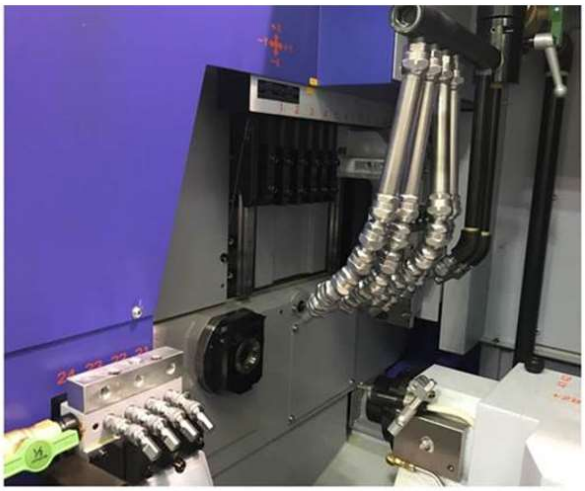
Example: STAR SV-12/20/32 Series – Kit of articulated steel tubes

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	
1	ME-IC-01-04	General cooling – Main and Subspindle	10x1	
2	ME-AC-01-00	General cooling – Main and Subspindle	10x6	
3	ME-AC-01-01	General cooling – Main and Subspindle	10x1	
4	ME-NZ-01-00	General cooling – Main and Subspindle	6x1	
5	ME-NZ-01-01	General cooling – Main and Subspindle	4x1	
6	ME-FK-01-00	Fastening keys	1x1	

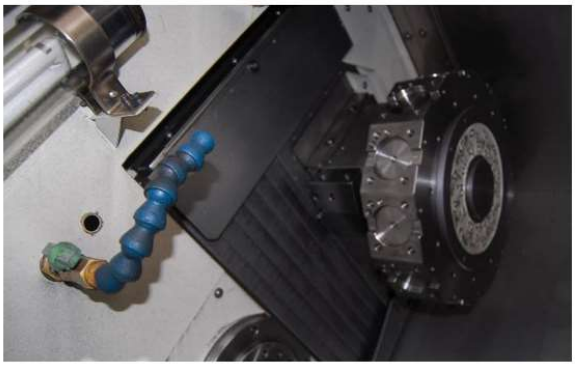


BEFORE

AFTER

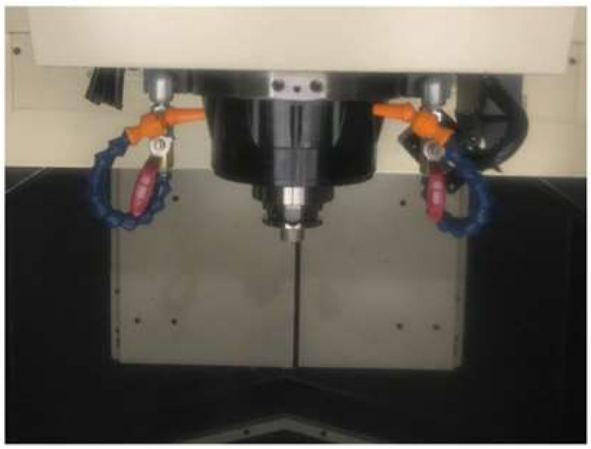


BEFORE



AFTER

BEFORE



AFTER

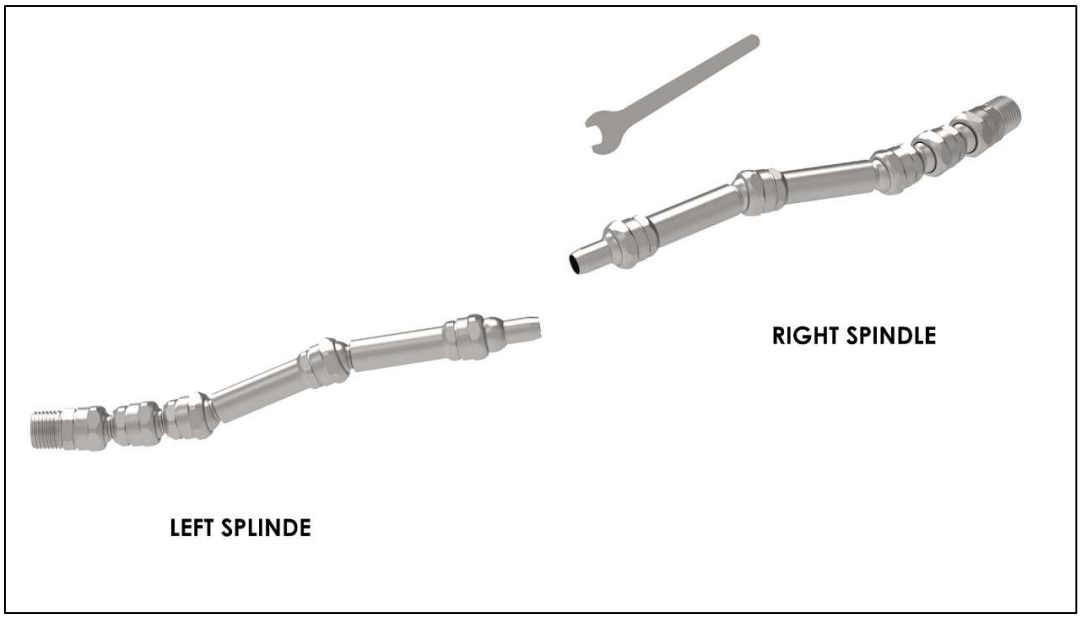
KITS FOR GENERAL COOLING OF MACHINES

To substitute plastic tubes with articulated steel tubes. Guarantees security in the positioning. Withholds the vibration and pressure of the coolant without losing position. Guarantees that the coolant will always be directed to the same point.

We can prepare kits for any machine, just send the pictures of existing plastic articulated tubes and connection thread to the machine and we will send a quotation.

NAKAMURA-TOME

Ref.	Description
MK-NT-01-00	Kit Single Outlet MEGA for main spindle or sub spindle for NAKAMURA lathes series AS-200, SC-100/150, WT-100/150 and WY-100/150.
MK-NT-01-01	Kit Single Outlet MEGA for main and sub spindle for NAKAMURA lathes series AS-200, SC-100/150, WT-100/150 and WY-100/150.
MK-NT-01-02	Kit Single Outlet GIGA for main or sub spindle for NAKAMURA lathes series SC-250/300, WT-250/300 and WY-250.
MK-NT-01-03	Kit Single Outlet GIGA for main and sub spindle for NAKAMURA lathes series SC-250/300, WT-250/300 and WY-250.

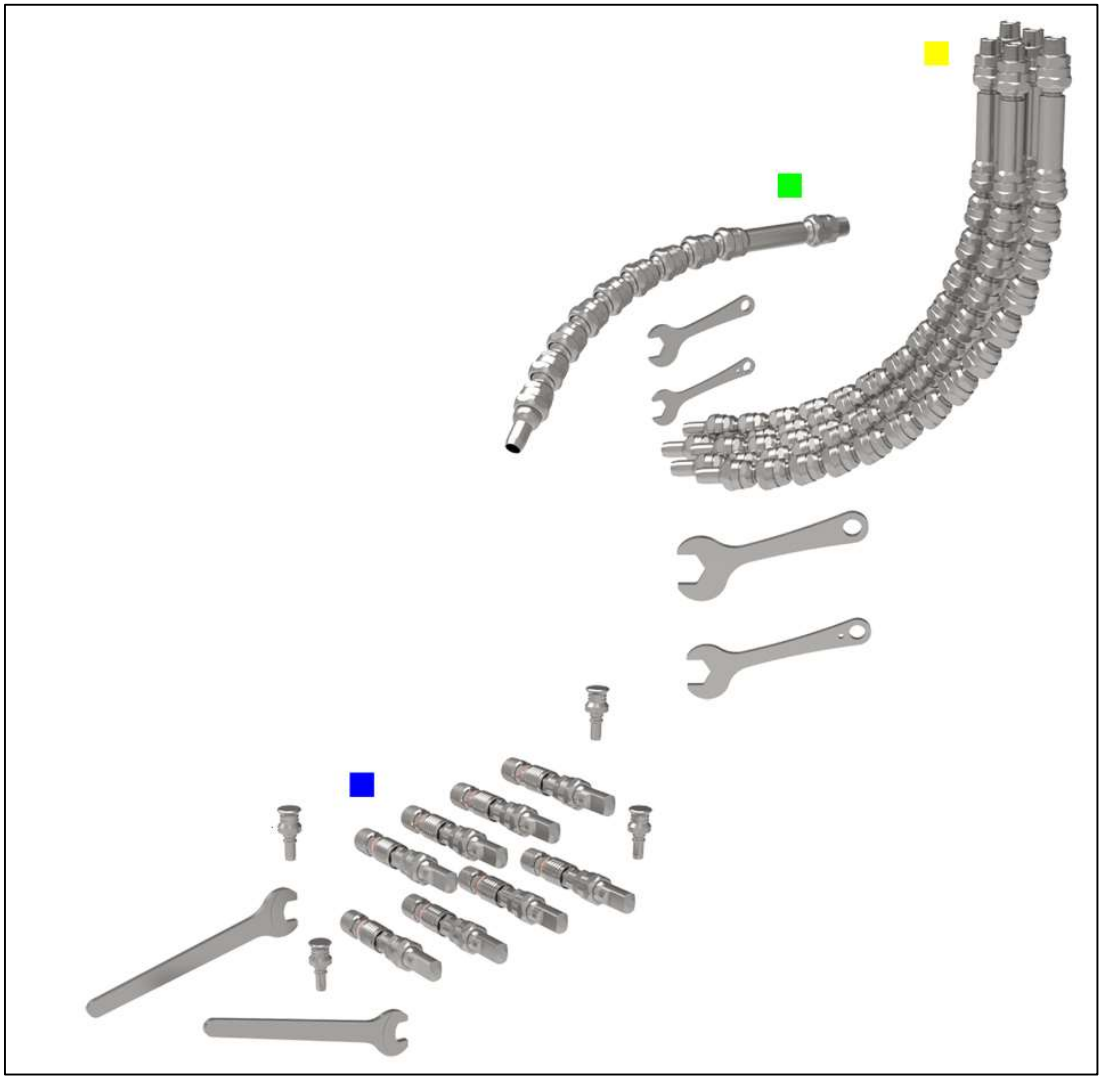


Example: MK-NT-01-01 - Kit of articulated steel tubes

STAR MICRONICS

Ref.	Description
MK-SM-01-00	Kit articulated steel tubes MEGA (6 tubes) + HECTO (4 tubes) for STAR SR-20J. General cooling and back tool post.
MK-SM-01-00-B	Kit articulated steel tubes MEGA (6 tubes) + HECTO (4 tubes) for STAR SR-20J. General cooling and back tool post articulated tubes with quick connection fittings.
MK-SM-01-01	Kit articulated steel tubes MEGA (5 tubes) + HECTO (8 tubes) for STAR SR-20JII. General cooling and back tool post.
MK-SM-01-01-B	Kit articulated steel tubes MEGA (5 tubes) + HECTO (8 tubes) for STAR SR-20JII. General cooling and back tool post articulated tubes with quick connection fittings.
MK-SM-01-02	Kit articulated steel tubes MEGA (6 tubes) + HECTO (8 tubes) for STAR SR-20R IV. General cooling and back tool post.
MK-SM-01-02-B	Kit articulated steel tubes MEGA (6 tubes) + HECTO (8 tubes) for STAR SR-20R IV. General cooling and back tool post articulated tubes with quick connection fittings.
MK-SM-01-03	Kit articulated steel tubes MEGA (9 tubes) + HECTO (8 tubes) for STAR SR-38. General cooling and back tool post.
MK-SM-01-03-B	Kit articulated steel tubes MEGA (9 tubes) + HECTO (8 tubes) for STAR SR-38. General cooling and back tool post with quick connection fittings.
MK-SM-01-04	Kit articulated steel tubes MEGA (5 tubes) + HECTO (4 tubes) for STAR SR-32J. General cooling and back tool post.
MK-SM-01-04-B	Kit articulated steel tubes MEGA (5 tubes) + HECTO (4 tubes) for STAR SR-32J. General cooling and back tool post articulated tubes with quick connection fittings.
MK-SM-01-05	Kit articulated steel tubes MEGA (10 tubes) for STAR SV-12/20/32. General cooling for main and sub spindle.
MK-SM-01-06	Kit articulated steel tubes MEGA (6 tubes) +HECTO (8 tubes) for STAR SW-12RII. General cooling and back tool post.
MK-SM-01-06-B	Kit articulated steel tubes MEGA (6 tubes) +HECTO (8 tubes) for STAR SW-12RII. General cooling and back tool post articulated tubes with quick connection fittings.
MK-SM-01-07	Kit articulated steel tubes MEGA (7 tubes) + HECTO (4 tubes) for STAR SW-20. General cooling and back tool post.
MK-SM-01-07-B	Kit articulated steel tubes MEGA (7 tubes) + HECTO (4 tubes) for STAR SW-20. General cooling and back tool post articulated tubes with quick connection fittings.

Ref.	Description
MK-SM-01-08	Kit articulated steel tubes MEGA (10 tubes) + HECTO (8 tubes) for STAR SV-20R. General cooling and back tool post.
MK-SM-01-08-B	Kit articulated steel tubes MEGA (10 tubes) + HECTO (8 tubes) for STAR SV-20R. General cooling and back tool post articulated tubes with quick connection fittings.
MK-SM-01-09	Kit articulated steel tubes MEGA (5 tubes) + HECTO (4 tubes) for STAR SB-20R. General cooling and back tool post.
MK-SM-01-10	Kit articulated steel tubes MEGA (3 tubes) + HECTO (4 tubes) for STAR SR-10J. General cooling main and sub spindle.
MK-SM-01-11	Kit articulated steel tubes MEGA (17 tubes) + HECTO (1 tube) for STAR ST-20 and ST-38. General cooling main and sub spindle.



Example: MK-SM-01-02-B - Kit of articulated steel tubes for STAR SR-20R IV with quick connectors fittings for the articulated steel tubes mounted in the back-tool post.

CITIZEN

Ref.	Description
MK-CI-01-00	Kit articulated steel tubes HECTO (5 tubes) for CITIZEN R04 & R07.
MK-CI-01-01	Kit articulated steel tubes HECTO (5 tubes) for CITIZEN B12/B16.
MK-CI-01-02	Kit articulated steel tubes HECTO (9 tubes) + MEGA (1 tube) for CITIZEN K12 & K16.
MK-CI-01-03	Kit articulated steel tubes MEGA (9 tubes) for CITIZEN A20 VII.
MK-CI-01-04	Kit articulated steel tubes HECTO (3 tubes) + MEGA (6 tubes) for CITIZEN A32.
MK-CI-01-05	Kit articulated steel tubes HECTO (9 tubes) for CITIZEN L12.
MK-CI-01-06	Kit articulated steel tubes HECTO (7 tubes) for CITIZEN L20.
MK-CI-01-07	Kit articulated steel tubes HECTO (4 tubes) + MEGA (6 tubes) for CITIZEN L20 X.
MK-CI-01-08	Kit articulated steel tubes HECTO (4 tubes) + MEGA (4 tubes) for CITIZEN L20 XII.
MK-CI-01-09	Kit articulated steel tubes HECTO (2 tubes) + MEGA (11 tubes) for CITIZEN M16 VIII.
MK-CI-01-10	Kit articulated steel tubes MEGA (14 tubes) for CITIZEN M32 V.
MK-CI-01-11	Kit articulated steel tubes MEGA (14 tubes) for CITIZEN M32 VIII.

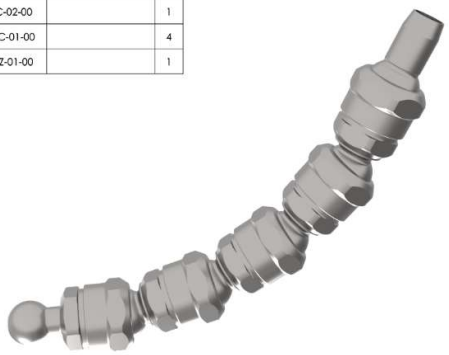
KITS FOR TOOL HOLDERS: ARTICULATED STEEL TUBES

Articulated steel tubes to substitute brass nozzle ball or brass tube. Avoids wear and consequent mechanical slack as all parts are manufactured in steel. Provides a much better orientation of the nozzle and delivery of coolant. The complete range of nozzles in the SCS program can be used to optimize cooling.

Ref.	Description
MK-TH-01-00	Kit for stationary or driven tool holder. Initial connection: Ball Ø 10 mm. HECTO. (1 x HE-IC-02-00 + 4 x HE-AC-01-00 + 1x HE-NZ-01-00)
MK-TH-01-01	Kit for stationary or driven tool holder. Initial connection: Ball Ø 12 mm. HECTO. (1 x HE-IC-02-01 + 4 x HE-AC-01-00 + 1x HE-NZ-01-00)
MK-TH-01-02	Kit for stationary or driven tool holder. Initial connection: Ball Ø 14 mm. HECTO. (1 x HE-IC-02-02 + 4 x HE-AC-01-00 + 1x HE-NZ-01-00)
MK-TH-01-03	Kit for stationary or driven tool holder. Initial connection: Ball Ø 15 mm. HECTO. (1 x HE-IC-02-03 + 4 x HE-AC-01-00 + 1x HE-NZ-01-00)
MK-TH-01-04	Kit for stationary or driven tool holder. Initial connection: BSPP 1/8". HECTO. (1 x HE-IC-01-00 + 4 x HE-AC-01-00 + 1x HE-NZ-01-00)

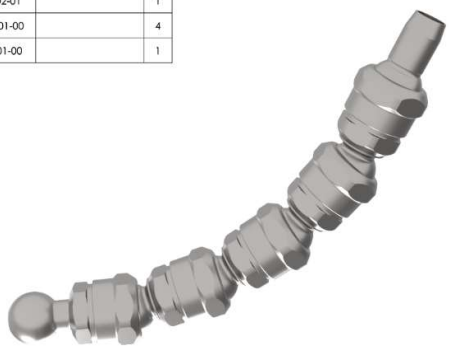
MK-TH-01-04 – Kit mounted in a rotary tool holder with 4 articulated segments, straight nozzle ID:6 mm and BSPP 1/8” connection.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-IC-02-00		1
2	HE-AC-01-00		4
3	HE-NZ-01-00		1



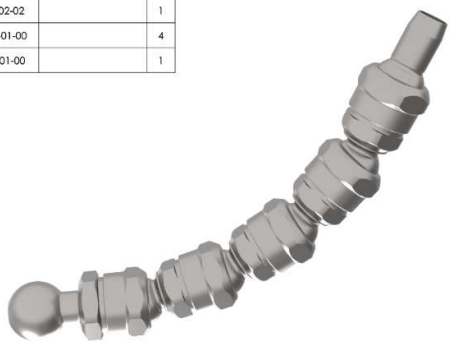
MK-TH-01-00

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-IC-02-01		1
2	HE-AC-01-00		4
3	HE-NZ-01-00		1



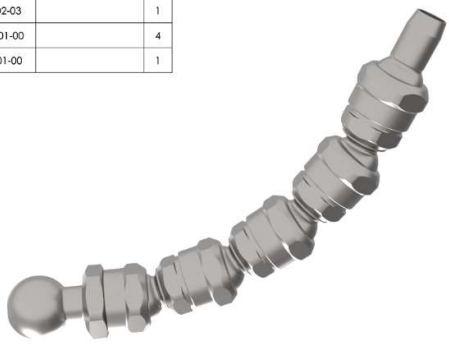
MK-TH-01-01

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-IC-02-02		1
2	HE-AC-01-00		4
3	HE-NZ-01-00		1



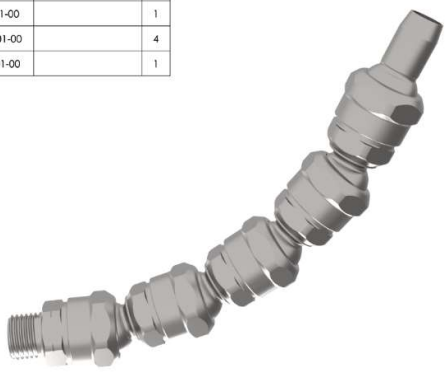
MK-TH-01-02

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-IC-02-03		1
2	HE-AC-01-00		4
3	HE-NZ-01-00		1



MK-TH-01-03

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-IC-01-00		1
2	HE-AC-01-00		4
3	HE-NZ-01-00		1



MK-TH-01-04

KITS FOR GENERAL COOLING: STEEL NOZZLES AND INITIAL CONNECTION ADAPTABLE TO COPPER OR STEEL TUBES

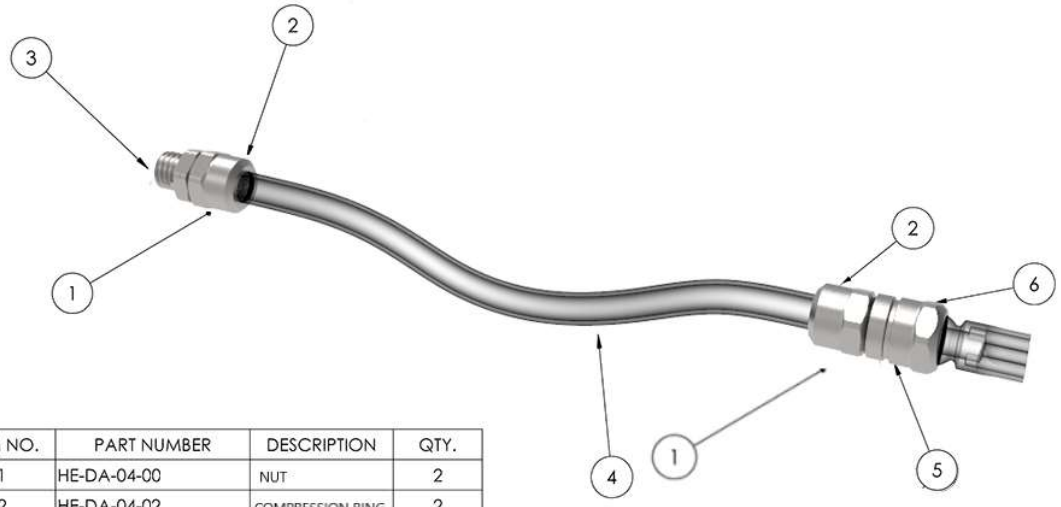
Steel nozzles from the HECTO or DECA (though hole 6 mm or 3 mm) family attached to copper or steel tubes take full advantage of precise coolant flow through machined nozzles with the flexibility and low-cost of widely used tubes. This solution represents a step forward in traditional cooling using copper or steel tubes in which the operator flattens the end of the tube with little or no guarantee on the exact flow and precision directing the coolant stream.

Additionally, any nozzle from the HECTO or DECA family can be used, thus optimizing cooling delivery. The connection to the tool holder can be done using fittings of the HECTO or DECA family. A low-cost solution which improves dramatically the coolant delivery on existing machines.

The SCS Manual tube bending tool ref. SP-BT-01-00 and -01 is highly recommended to ensure small and perfect radius bending without strangling the coolant tube (outer diameter 8 or 6 mm).

With no tube included (OD:8 mm ID:6 mm). Connecting parts only. HECTO.

Ref.	Description
MK-GC-01-00	**Basic kit for connecting tube OD:8 mm (steel or copper) with HECTO range of nozzles and initial connection BSPP1/8".** **For general cooling with any nozzle from the HECTO family:** **(Recommended to purchase HECTO system wrenches to avoid excessive torque ref. HE-FK-01-00)** ***Initial Connection:*** 1 unit HE-IC-03-00 BSPP 1/8"(M) to Nut for compression ring ID:8 mm HECTO. ***Parts for adapting OD:8 mm tube:*** 2 units HE-DA-04-00 Nut HECTO(F) to compression ring ID:8 mm. 2 units HE-DA-04-02 Compression ring ID:8 mm. HECTO. 1 unit HE-DA-04-01 Adaptor HECTO(M) to Nut for compression ring ID:8 mm.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-04-00	NUT	2
2	HE-DA-04-02	COMPRESSION RING	2
3	HE-IC-03-00	BSPP1/8" - NUT	1
4	COPPER/STEEL TUBE	NOT INCLUDED	1
5	HE-DA-04-01	ADAPT. HECTO-NUT	1
6	HE-NZ-01-05	NOT INCLUDED	1

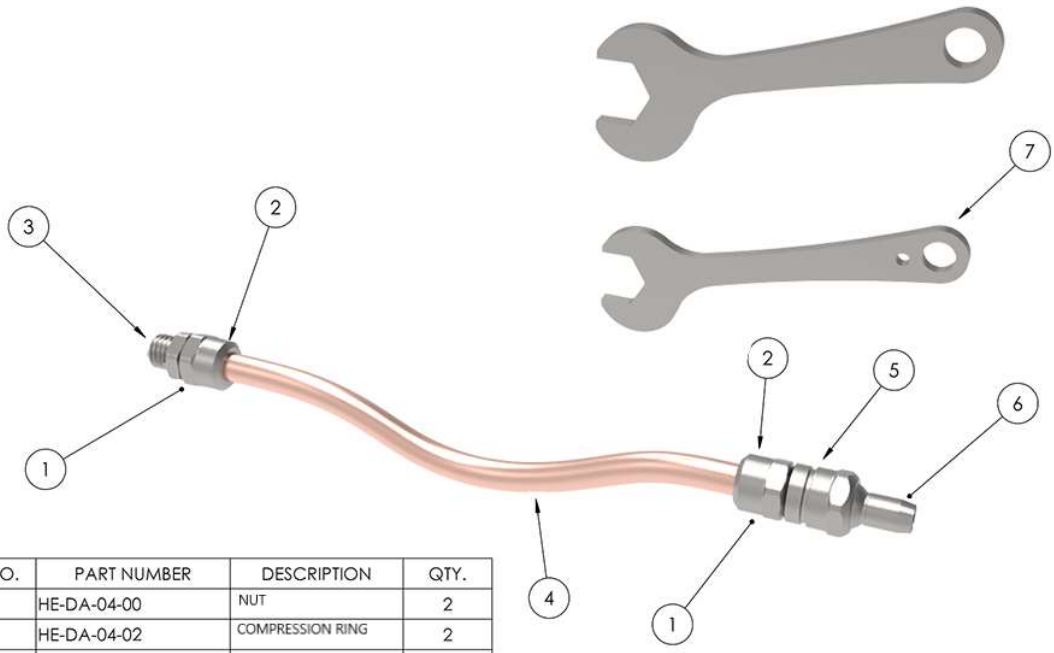
Tube OD:8 mm not included. Drawn just for better understanding of the functionality of the parts

Nozzle HE-NZ-01-05 not included

MK-GC-01-00

With Copper tube OD:8 mm ID:6 mm. HECTO.

Ref.	Description
MK-GC-02-L102-B1/8 (102mm copper tube) MK-GC-02-L152-B1/8 (152mm copper tube) MK-GC-02-L203-B1/8 (203mm copper tube) MK-GC-02-L305-B1/8 (305mm copper tube)	**Kit copper tube OD: 8 mm, ID:6 mm, L=4"/6"/8"/12" (102/152/203/305 mm), initial connection BSPP1/8" and HECTO nozzle:** **For general cooling with a single outlet L=4"/6"/8"/12" (102/152/203/305 mm).** ***Copper tube Kit OD: 8 mm HECTO:*** 1 unit. HE-DT-01 BSPP1/8"(M) thread, nut and compression ring, copper tube OD:8 mm, ID:6 mm and L:4"/6"/8"/12" (102/152/203/305 mm), other end with compression ring and HECTO(M) thread. ***Coolant nozzles:*** 1 unit HE-NZ-01-00 Straight nozzle. ID:6 mm & L:16 mm ***Fastening wrenches for the articulated system:*** 1 unit HE-FK-01-00 Wrenches for fastening the 2 hexagons used in the HECTO program. SW13 & SW15.



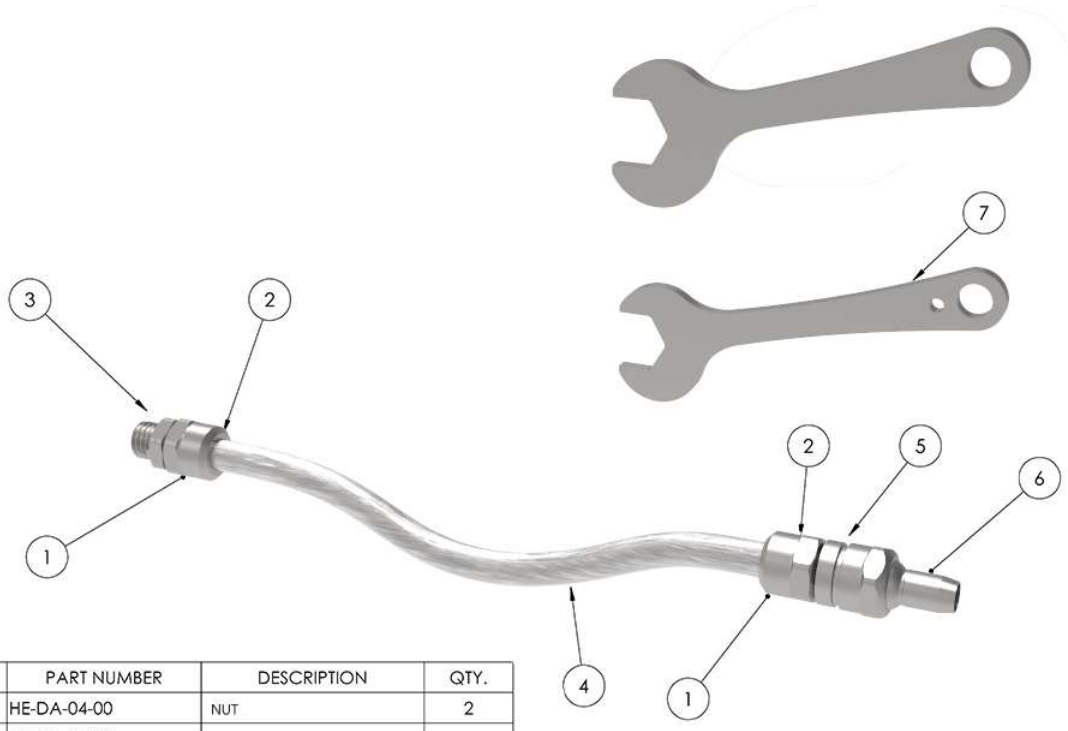
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-04-00	NUT	2
2	HE-DA-04-02	COMPRESSION RING	2
3	HE-IC-03-00	BSPP1/8" - NUT	1
4	Copper tube	102/152/203/305 mm*	1
5	HE-DA-04-01	ADAPT. HECTO-NUT	1
6	HE-NZ-01-00	NOZZLE STRAIGHT	1
7	HE-FK-01-00	WRENCHES HECTO	1

*The copper tube can be cut and bended to the desired length and shape by the customer

MK-GC-02-00/01/02/03

With Steel tube OD:8 mm ID:6 mm. HECTO.

Ref.	Description
MK-GC-03-L102-B1/8 (102mm steel tube) MK-GC-03-L152-B1/8 (152mm steel tube) MK-GC-03-L203-B1/8 (203mm steel tube) MK-GC-03-L305-B1/8 (305mm steel tube)	**Kit steel tube OD: 8 mm, ID:6 mm, L=4"/6"/8"/12" (102/152/203/305 mm), initial connection BSPP1/8" and HECTO nozzle:** **For general cooling with a single outlet L=4"/6"/8"/12" (102/152/203/305 mm).** ***Steel tube Kit OD: 8 mm HECTO:*** 1 unit. HE-DT-02 BSPP1/8"(M) thread, nut and compression ring, steel tube OD:8 mm, ID:6 mm and L:4"/6"/8"/12" (102/152/203/305 mm), other end with compression ring and HECTO(M) thread. ***Coolant nozzles:*** 1 unit HE-NZ-01-00 Straight nozzle. ID:6 mm & L:16 mm ***Fastening wrenches for the articulated system:*** 1 unit HE-FK-01-00 Wrenches for fastening the 2 hexagons used in the HECTO program. SW13 & SW15.



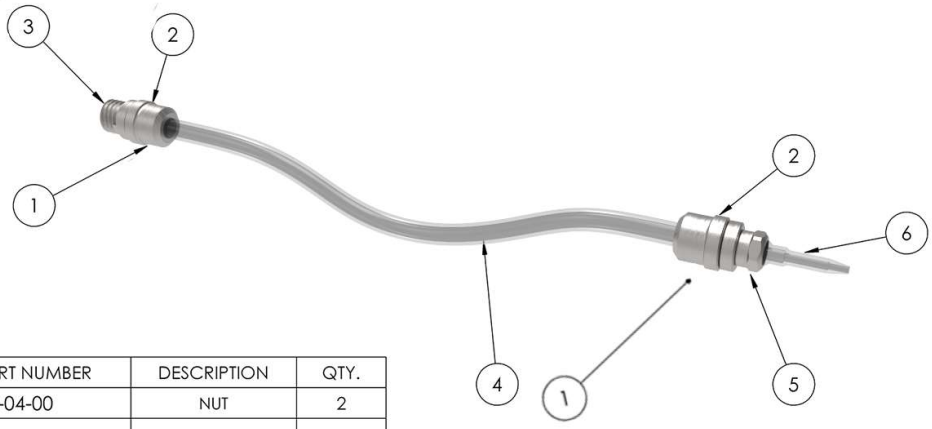
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-04-00	NUT	2
2	HE-DA-04-02	COMPRESSION RING	
3	HE-IC-03-00	BPSPP1/8" - NUT	1
4	Steel tube	102/152/203/305 mm*	1
5	HE-DA-04-01	ADAPT.HECTO-NUT	1
6	HE-NZ-01-00	NOZZLE STRAIGHT	1
7	HE-FK-01-00	WRENCHES HECTO	1

*The steel tube can be cut and bended to the desired length and shape by the customer

MK-GC-03-00/01/02/03

With no tube included (OD:6 mm ID:4 mm). Connecting parts only. DECA.

Ref.	Description
MK-GC-11-00	**Basic kit for connecting tube OD:6 mm (steel or copper) with DECA range of nozzles and initial connection M8x1.** **For general cooling with any nozzle from the DECA family:** **(Recommended to purchase DECA system wrenches to avoid excessive torque ref. DE-FK-01-00)** ***Initial Connection:*** 1 unit DE-IC-03-00 M8x1(M) to Nut for compression ring ID:6 mm DECA. ***Parts for adapting OD:6 mm tube:*** 2 units DE-DA-04-00 Nut DECA(F) to compression ring ID:6 mm. 2 units DE-DA-04-02 Compression ring ID:6 mm. DECA. 1 unit DE-DA-04-01 Adaptor DECA(M) to Nut for compression ring ID:6 mm.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DE-DA-04-00	NUT	2
2	DE-DA-04-02	COMPRESSION RING	2
3	DE-IC-03-00	M8x1 to NUT	1
4	Cooper/Steel tube	Not included	1
5	DE-DA-04-01	ADAPT. DECA NUT	1
6	DE-NZ-01-04	Not included	1

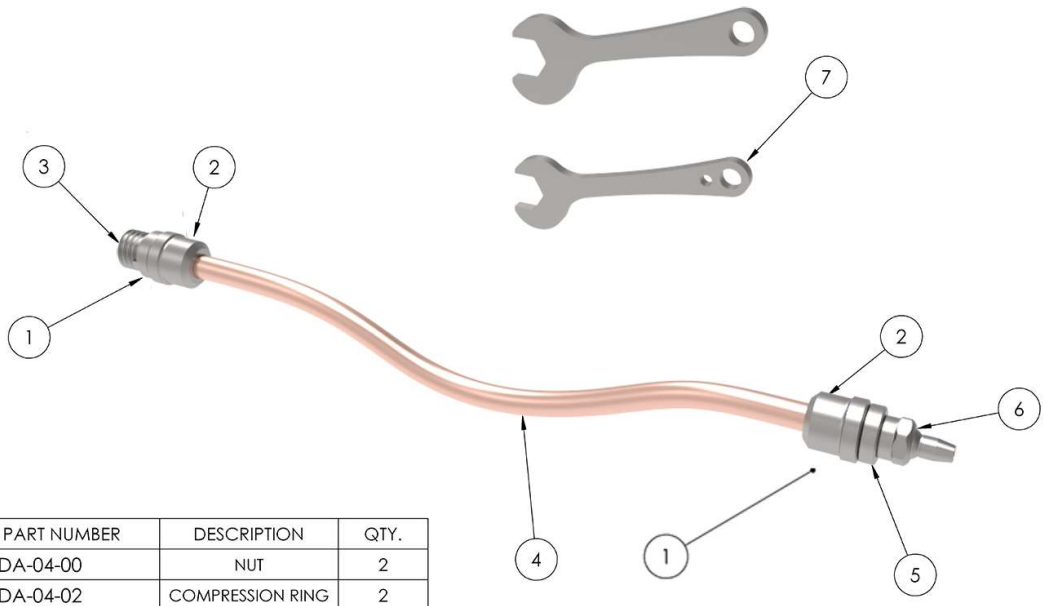
Tube OD: 6 mm not included. Drawn just for better understanding of the functionality of the parts

Nozzle DE-NZ-01-04 not included

MK-GC-11-00

With Copper tube OD:6 mm ID:4 mm. DECA.

Ref.	Description
MK-GC-12-L102-M8 (102mm copper tube) MK-GC-12-L152-M8 (152mm copper tube) MK-GC-12-L203-M8 (203mm copper tube) MK-GC-12-L305-M8 (305mm copper tube)	**Kit copper tube OD: 6 mm, ID:4 mm, L=4"/6"/8"/12" (102/152/203/305 mm), initial connection M8x1 and DECA nozzle:** **For general cooling with a single outlet L=4"/6"/8"/12" (102/152/203/305 mm).** ***Copper tube Kit OD: 6 mm DECA:*** 1 unit. DE-DT-01 M8x1(M) thread, nut and compression ring, copper tube OD:6 mm, ID:4 mm and L:4"/6"/8"/12" (102/152/203/305 mm), other end with compression ring and DECA(M) thread. ***Coolant nozzles:*** 1 unit DE-NZ-01-00 Straight nozzle. ID:3 mm & L:9 mm ***Fastening wrenches for the articulated system:*** 1 unit DE-FK-01-00 Wrenches for fastening the 2 hexagons used in the DECA program. SW8 & SW9.



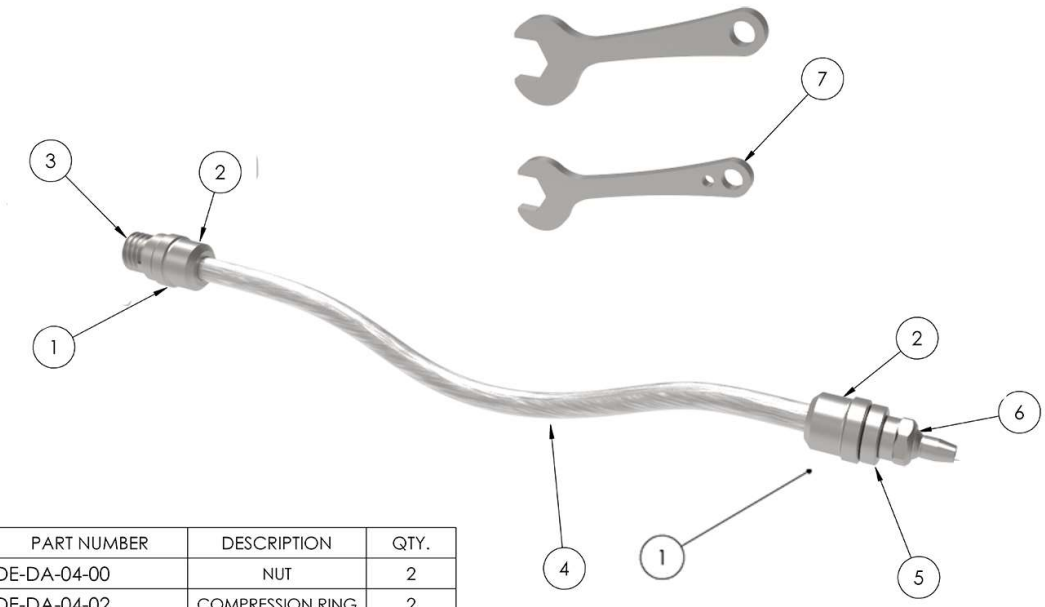
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DE-DA-04-00	NUT	2
2	DE-DA-04-02	COMPRESSION RING	2
3	DE-IC-03-00	M8x1 to NUT	1
4	Copper tube	102/152/203/305mm*	1
5	DE-DA-04-01	ADAPT. DECA NUT	1
6	DE-NZ-01-00	NOZZLE STRAIGHT	1
7	DE-FK-01-00	WRENCHES DECA	1

*The copper tube can be cut and bended to the desired length and shape by the customer

MK-GC-12-00/01/02/03

With Steel tube OD:6 mm ID:4 mm. DECA.

Ref.	Description
MK-GC-12-L102-M8 (102mm steel tube) MK-GC-12-L152-M8 (152mm steel tube) MK-GC-12-L203-M8 (203mm steel tube) MK-GC-12-L305-M8 (305mm steel tube)	**Kit steel tube OD: 6 mm, ID:4 mm, L=4"/6"/8"/12" (102/152/203/305 mm), initial connection M8x1 and DECA nozzle:** **For general cooling with a single outlet L=4"/6"/8"/12" (102/152/203/305 mm).** ***Steel tube Kit OD: 6 mm DECA:*** 1 unit. DE-DT-02 M8x1(M) thread, nut and compression ring, steel tube OD:6 mm, ID:4 mm and L:4"/6"/8"/12" (102/152/203/305 mm), other end with compression ring and DECA(M) thread. ***Coolant nozzles:*** 1 unit DE-NZ-01-00 Straight nozzle. ID:3 mm & L:9 mm ***Fastening wrenches for the articulated system:*** 1 unit DE-FK-01-00 Wrenches for fastening the 2 hexagons used in the DECA program. SW8 & SW9.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DE-DA-04-00	NUT	2
2	DE-DA-04-02	COMPRESSION RING	2
3	DE-IC-03-00	M8x1 to NUT	1
4	Steel tube	102/152/203/305mm*	1
5	DE-DA-04-01	ADAPT. DECA NUT	1
6	DE-NZ-01-00	NOZZLE STRAIGHT	1
7	DE-FK-01-00	WRENCHES DECA	1

*The steel tube can be cut and bended to the desired length and shape by the customer

MK-GC-13-00/01/02/03

KITS FOR CNC TURRET DISC – 90º OUTLET

To substitute copper tubes. Traditional cooling with copper tubes implies inconsistent bending with potential strangling of the coolant flow. Additionally, the extreme of tube (coolant outlet) is just shaped by flattening it without any precision. This kit brings all the advantages and possibilities of the SCS articulated steel tubes maximizing the coolant flow and allowing to easily direct the coolant stream where it is truly needed.

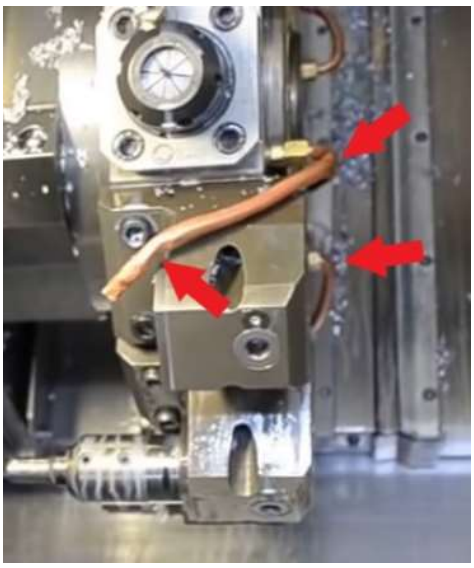
Ref.	Description
MK-TD-01-00	Kit single 90º outlet on back face of turret disc. BSPT 1/8". HECTO. (1 x HE-DA-02-00 + 1 x MI-CA-01-13 + 4 x HE-AC-01-00 + 1 x HE-AC-01-01 + 1x HE-NZ-01-00)
MK-TD-01-01	Kit single 90º outlet on back face of turret disc. NPT 1/8". HECTO. (1 x HE-DA-02-00 + 1 x MI-CA-01-19 + 4 x HE-AC-01-00 + 1 x HE-AC-01-01 + 1x HE-NZ-01-00)

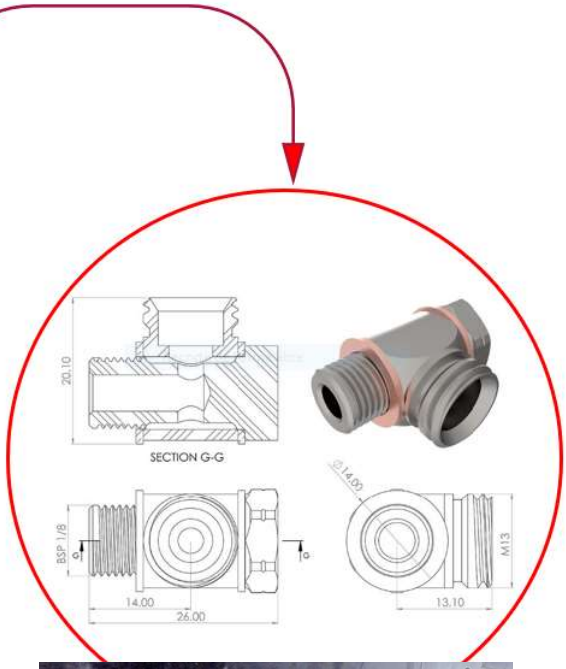
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-02-00		1
2	MI-CA-01-13		1
4	HE-AC-01-00		4
5	HE-AC-01-01		1
3	HE-NZ-01-00		1

MK-TD-01-00

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HE-DA-02-00		1
2	MI-CA-01-19		1
4	HE-AC-01-00		4
5	HE-AC-01-01		1
3	HE-NZ-01-00		1

MK-TD-01-01




20.10
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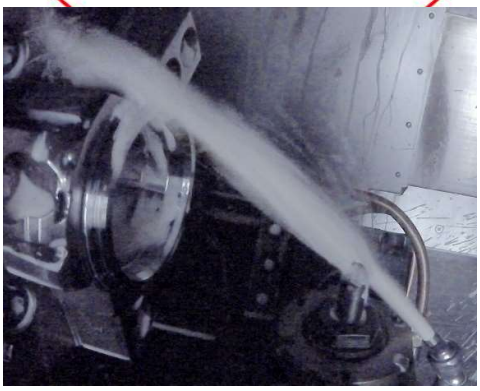
BSP 1/8
14.00
26.00
13.10
M13



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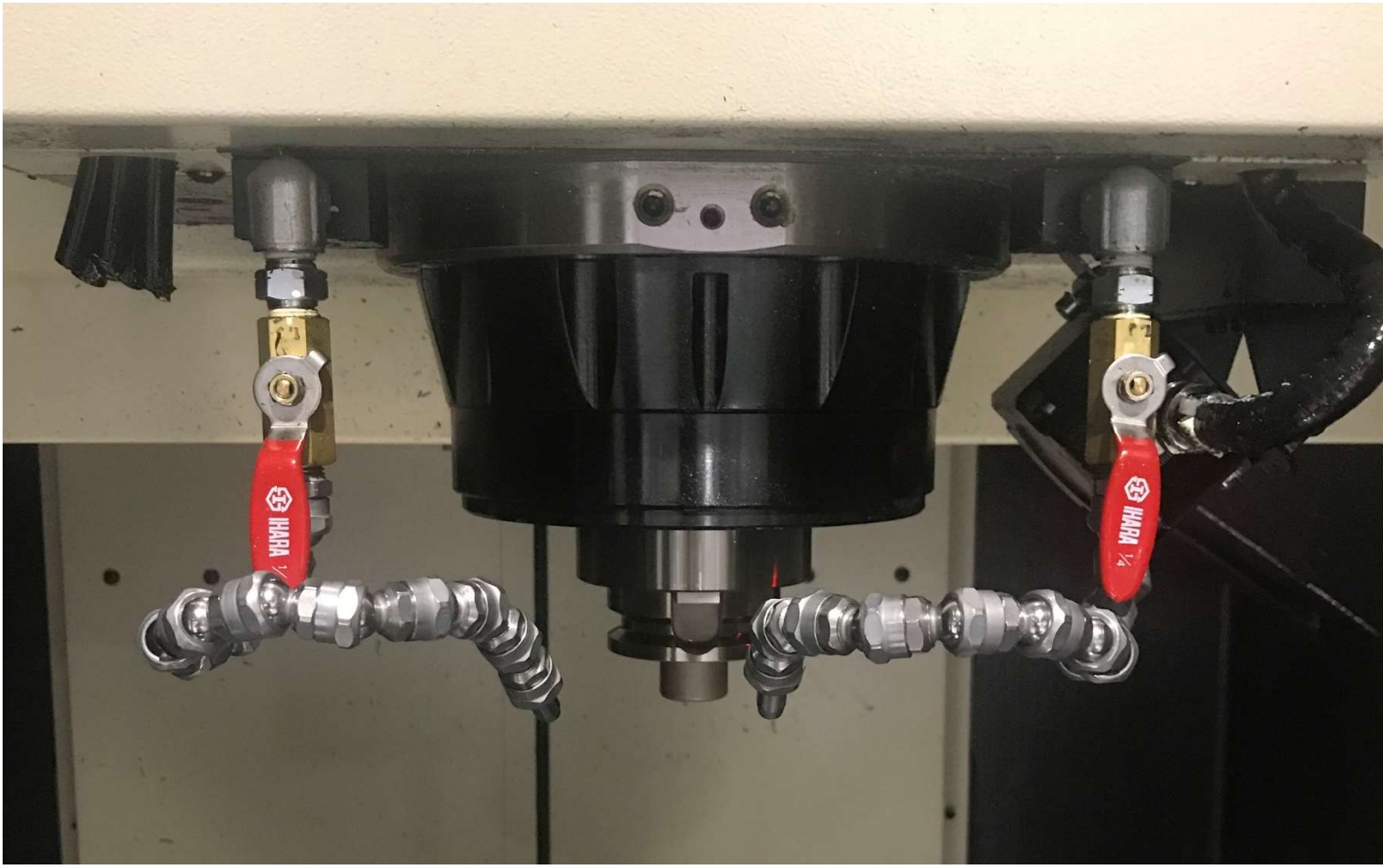

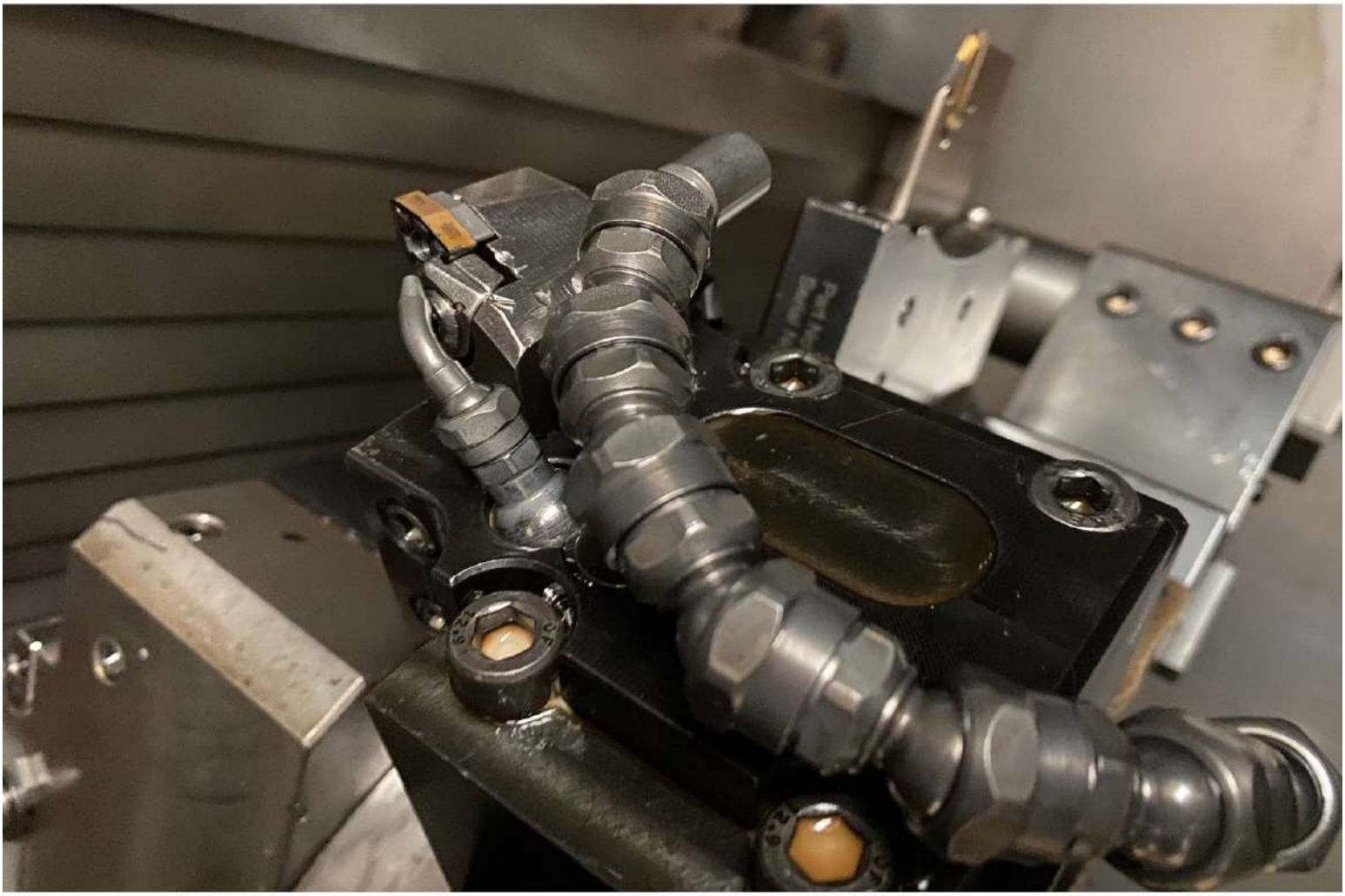

ARTICULATED STEEL TUBES FOR COOLANT DISTRIBUTION

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