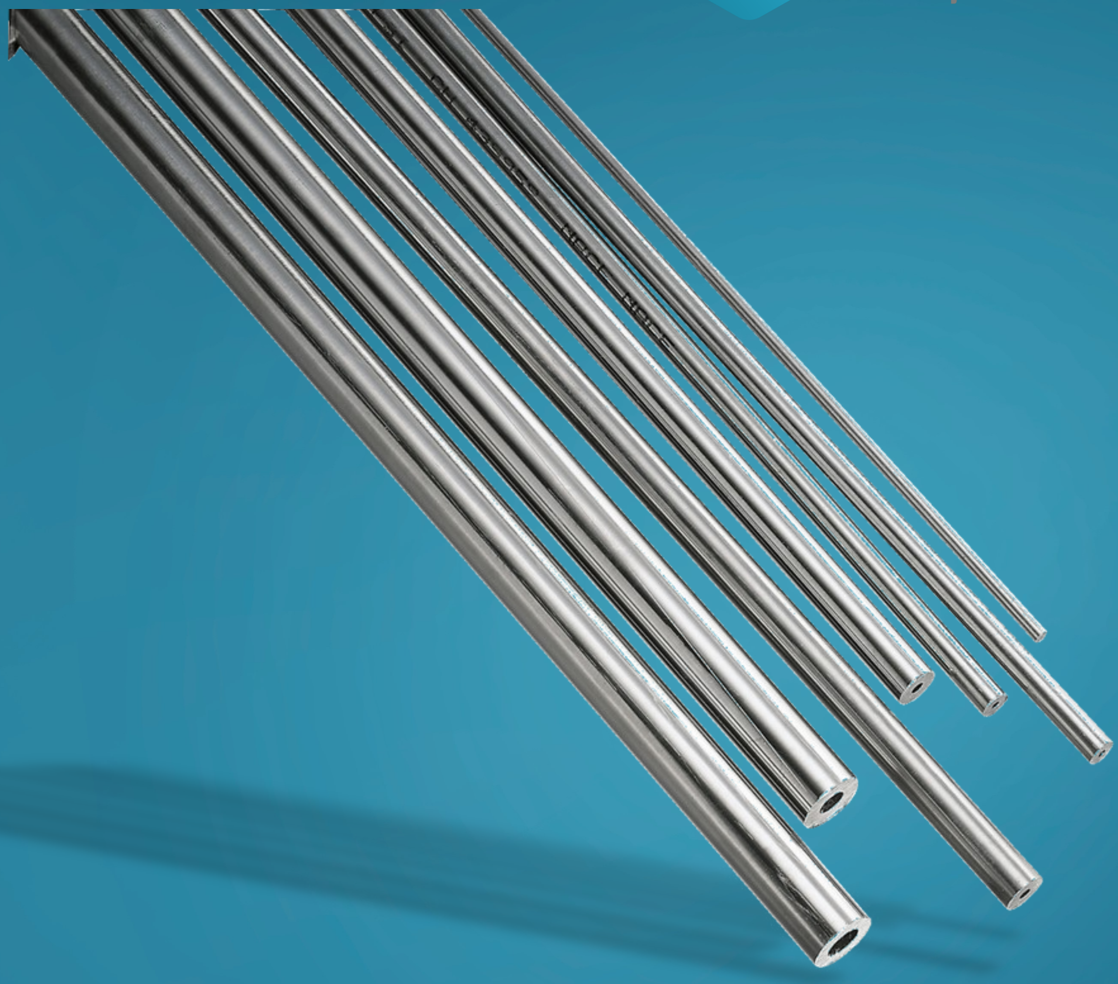
NOVA SWISS

NOVA SWISS is proud member of

Hydrogen Europe



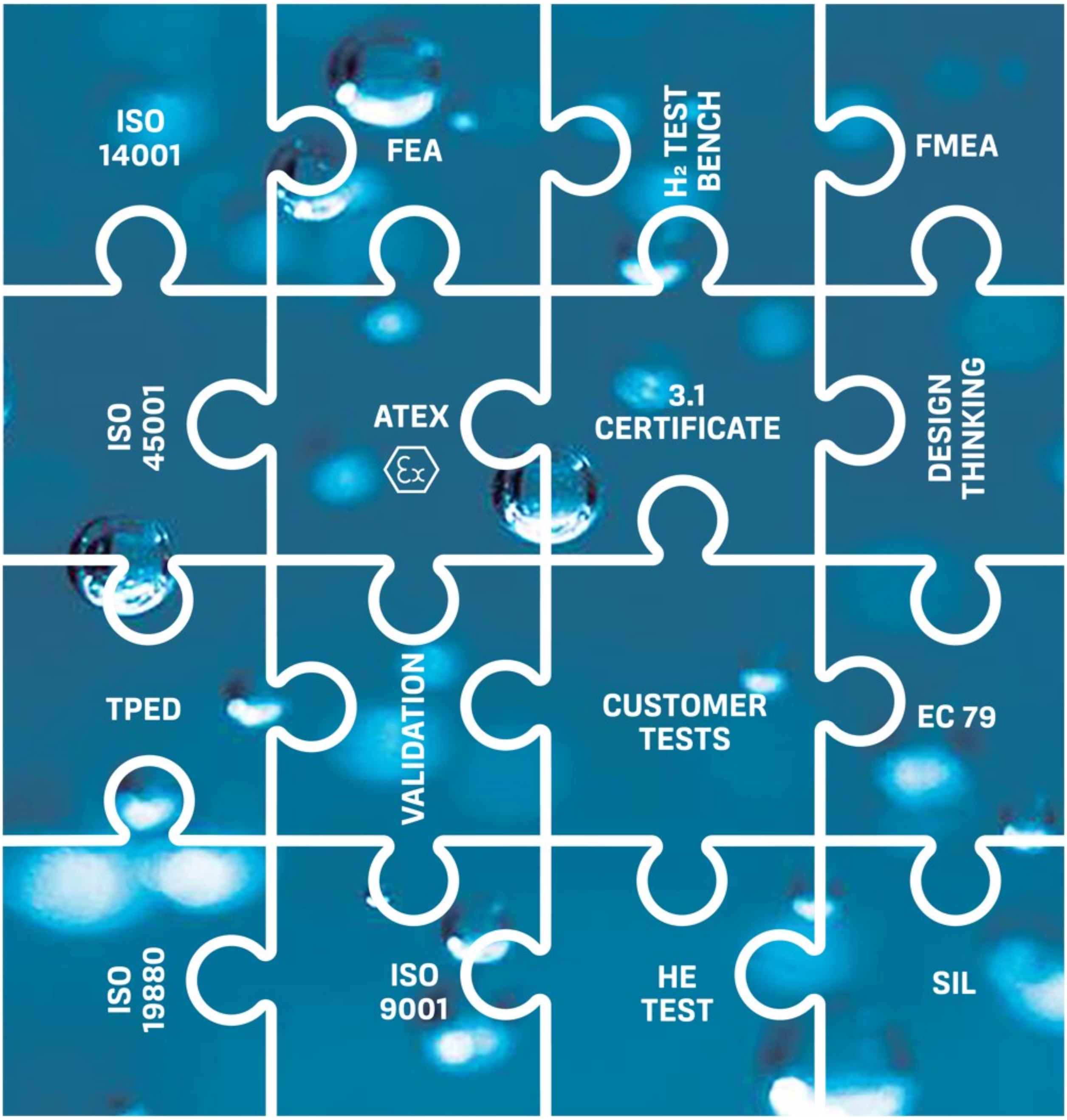
UP TO 100'000 PSI (7'000 BAR)
HIGH-PRESSURE TUBING

Focus on Safety and Reliability

In order to meet today's safety requirements Nova Swiss high-pressure components are designed and manufactured under strongest quality guidelines.

- Comprehensive safety: Highest quality standards, deep knowledge and extensive testing are the indispensable pieces of the whole puzzle
- Peace of mind: Swiss precision, many years of experience in high-pressure technology lead to low failure probability & outstanding tightness
- Plug & Play: Nova Swiss products are validated and can be used without extra test
- Low maintenance costs: Less maintenance, longer lifespan and higher number of operating-cycles make Nova Swiss products more economic and sustainable.

Only a complete puzzle ...



... leads to comprehensive safety.

High-Pressure Tubing

Nova Swiss offers a wide range of high-pressure tubing, from 10’000 psi (700 bar) up to 100’000 psi (7’000 bar) for leak-free transfer of gases and liquids.

All the tubing is made and tested according to strict criteria of high-grade stainless steel, seamless, cold drawn, and hardened to achieve high strength and corrosion resistance.

Tubing Features:

- Available from outer tube Ø of 1/8” up to 1”
- Standard material Din 1.4404 / AISI 316L
- Length sticks 6-7 meter (19.7—23 ft)
- MAWP from 10’000 psi (690 bar) up to 100’000 psi (7’000 bar)
- For imperial and metric pressure connections
- Anti-vibration applications

Applications:

- High pressure H_2 and inert gas lines
- High pressure liquid lines
- Waterjet & Waterblast
- Oil & Gas
- Hydraulic and pneumatic test benches

Nova Swiss Tubing Range:

MAWP	Nova Part No.	Tube O.D. Ø	Tube I.D.	Pressure
10’000 psi (690 bar)	TBG109	9/16 (14.3)	9.1 (0.36)	9M
	TBG1012	3/4 (19.1)	13.1 (0.52)	12M
	TBG1016	1 (25.4)	17.5 (0.69)	16M
20’000 psi (1’380 bar)	TBG204	1/4 (6.4)	2.8 (0.11)	4M
	TBG206	3/8 (9.5)	5.2 (0.2)	6M
	TBG209	9/16 (14.3)	7.9 (0.31)	9M
	TBG2012	3/4 (19.1)	11.1 (0.44)	12M
	TBG2016	1 (25.4)	14.3 (0.56)	16M
30’000 psi (2’068 bar)	TBG302	1/8 (3.2)	1 (0.039)	LHP 1/8
60’000 psi (4’140 bar)	TBG604	1/4 (6.4)	2.49 (0.09)	4H / 4E
	TBG606	3/8 (9.5)	3.2 (0.13)	6H / 6E
	TBG609	9/16 (14.3)	4.8 (0.19)	9H / 6E
100’000 psi (7’000 bar)	TBG1004	1/4 (6.4)	1.6 (0.06)	4E

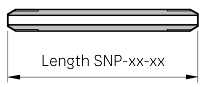
Straight & Radius Nipples

Nova Swiss nipples are manufactured from our standard tubing, available either straight (SNP) or 90° curved (RNP) pattern, upon request to a customized size and geometry.

Tube-end preparation of the thread and tapers are machined according to the exact specification for each pressure range and tube diameter. The quality of machined surfaces provides the assurance of a leak-free high-pressure connection for gas and liquid applications.

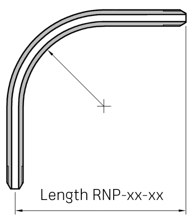
Straight Nipples

MAWP	Nova Part No.	Tube O.D. Ø inch (mm)	Length mm (inch)	Pressure connection
10'000 psi	SNP109	9/16 (14.3)	88 (3.46)	9M
	SNP1012	3/4 (19.1)	104 (4.09)	12M
	SNP1016	1 (25.4)	138 (5.43)	16M
20'000 psi	SNP204	1/4 (6.4)	56 (2.20)	4M
	SNP206	3/8 (9.5)	72 (2.83)	6M
	SNP209	9/16 (14.3)	88 (3.46)	9M
	SNP2012	3/4 (19.1)	104 (4.09)	12M
	SNP2016	1 (25.4)	138 (5.43)	16M
60'000 psi	SNP604	1/4 (6.4)	64 (2.52)	4H / 4E
	SNP606	3/8 (9.5)	82 (3.23)	6H / 6E
	SNP609	9/16 (14.3)	104 (4.09)	9H / 6E
100'000 psi	SNP1004	1/4 (6.4)	64 (2.52)	4E



Radius Nipples

MAWP	Nova Part No.	Tube O.D. Ø inch (mm)	Length mm (inch)	Radius mm inch	Pressure connection
10'000 psi	RNP109	9/16 (14.3)	124 (4.88)	67 (2.62)	9M
	RNP1012	3/4 (19.1)	158 (6.22)	89 (3.50)	12M
	RNP1016	1 (25.4)	210 (8.27)	117 (4.62)	16M
20'000 psi	RNP204	1/4 (6.4)	68 (2.68)	32 (1.25)	4M
	RNP206	3/8 (9.5)	90 (3.54)	44 (1.75)	6M
	RNP209	9/16 (14.3)	124 (4.88)	67 (2.62)	9M
	RNP2012	3/4 (19.1)	158 (6.22)	89 (3.50)	12M
	RNP2016	1 (25.4)	210 (8.27)	117 (4.62)	16M
60'000 psi	RNP604	1/4 (6.4)	72 (2.83)	32 (1.25)	4H / 4E
	RNP606	3/8 (9.5)	98 (3.86)	44 (1.75)	6H / 6E
	RNP609	9/16 (14.3)	134 (5.25)	67 (2.62)	9H / 6E
100'000 psi	RNP1004	1/4 (6.4)	100 (3.94)	25 (0.98)	4E



Coning and Threading Tools

Nova Swiss manual coning - and threading tool, up to tube outer Ø of 9/16” is perfect for high-pressure tube-end preparation in-situ or remote area.

With interchangeable components, one tool for coning and one for threading can be adapted to suit your demand.

Coning tool

Coning made simple, with one tool with interchangeable collets,. You can prepare the cone for all high-pressure tubing with outer Ø of 1/4”, 3/8” and 9/16”.

An universal cutter blade configuration for all tube diameters allows a quick tool preparation with no error, and correct cone angle. The depth of the cut is controlled by the feeding nut of the coning tool with a fine pitched thread.

Tube O.D. Ø Inch (mm)	Coning tool without collet	Collet	Cutter
1/4 (6.35)	580.1000	581.9128	5.5646.003
3/8 (9.53)	580.1000	581.9125	5.5646.003
9/16 (14.3)	580.1000	581.9124	5.5646.003

Threading tool

The Nova Swiss threading tool use the same tool holder for all threads up to tube Ø of 9/16”. The thread conversion is simply made by changing the interchangeable bushing and thread die in the tool.

The Built-in stop ensures the correct length of the thread and the guide bushing centers the tube resulting in a very precise thread.

Openings are provided in the tool for inspection and chip removal.

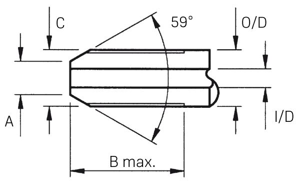
The coning tool can be used to hold the tube in position when performing the thread with the threading tool.

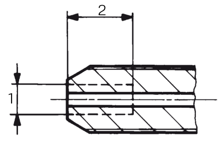
Tube O.D Ø Inch (mm)	Coning tool without collet	Pushing	Die
1/4 (6.35)	580.2040	581.9219	581.9212
3/8 (9.53)	580.2020	581.9218	581.9211
9/16 (14.3)	580.2010	581.9217	581.9210

Pressure Connections

Tube-end connections are high precision, made to fit connections with well established geometries and ease of use. Leakage-free connections are assured by precision surface machining and fitting accuracy of the connection components.

The tightness of medium- and high-pressure connections with components is achieved by a metal-to-metal seal forcing two slightly offset tapers onto another, without using a gasket or a seal ring. The connection can be installed and disconnected an arbitrary number of times without damaging the connection.

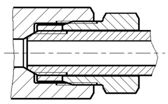




TBG302

10‘000 - 20‘000 psi Medium Pressure Connections (MPCT)

MPCT connections, with imperial UNF thread, guarantee a leak-free operation up to 20’000 psi (1’380 bar). The collar and gland compression nut are positioned in-line.



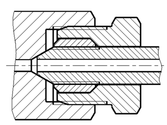
Nova Part No.	Tube O.D.Ø Inch (mm)	Tube I.D. Ø mm (inch)	A mm (inch)	B mm (inch)	C Left handed	Pressure Connection
TBG109	9/16 (14.3)	9.1 (0.36)	11.1 (0.44)	12.7 (0.50)	9/16-18 UNF	9M
TBG1012	3/4 (19.1)	13.1 (0.52)	14.7 (0.58)	15.9 (0.63)	3/4-16 UNF	12M
TBG1016	1 (25.4)	17.5 (0.69	20.6 (0.81)	19.8 (0.78)	1-14 UNS	16M
TBG204	1/4 (6.4)	2.8 (0.11)	3.6 (0.14)	8.7 (0.34)	1/4-28 UNF	4M
TBG206	3/8 (9.5)	5.2 (0.20)	6.4 (0.25)	11.1 (0.44)	3/8-24 UNF	6M
TBG209	9/16 (14.3)	7.9 (0.31)	1.4 (0.41)	12.7 (0.50)	9/16-18 UNF	9M
TBG2012	3/4 (19.1)	11.1 (0.44)	14.3 (0.56)	15.9 (0.63)	3/4-16 UNF	12M
TBG2016	1 (25.4)	14.3 (0.56)	18.3 (0.72)	19.8 (0.78)	1-14 UNS	16M

30‘000 psi High Pressure Connections (HPCT)

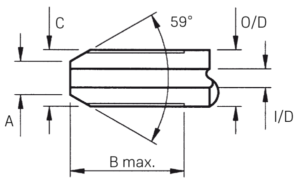
Nova Part No.	Tube O.D. Ø Inch (mm)	Tube I.D. Ø mm (inch)	A mm (inch)	B mm (inch)	C Left handed	Pressure Connection
TBG302	1/8 (3.2)	1 (0.039)	1.6 (0.063)	1.4 (0.55)	5/40 UNC	LHP 1/8

High Pressure Connections (HPCT & E) up to 100‘000 (7‘000 bar)

HPCT & E connections use and benefit the same technology as MPCT with leak-free operation up to 100’000 psi (7’000 bar). The collar is enclosed in the gland compression nut to reinforce the connection with high pressure loads. HPCT & E connections are available with imperial UNF thread and with a metric thread.



Pressure Connections...continued



60‘000 psi & 4000 bar High Pressure Connections (HPCT & E)

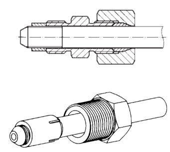
Nova Part No.	Tube O.D. Ø Inch (mm)	Tube I.D. Ø mm (inch)	A mm (inch)	B mm (inch)	C Left handed	Pressure Connection
TBG604	1/4 (6.4)	2.4 (0.09)	3.6 (0.14)	14.3 (0.56)	1/4-28 UNF	4H / 4E
TBG606	3/8 (9.5)	3.2 (0.13)	5.6 (0.22)	19.1 (0.75)	3/8-24 UNF	6H / 6E
TBG609	9/16 (14.3)	4.8 (0.19)	7.1 (0.28)	23.8 (0.94)	9/16-18 UNF	9H / 9E

7‘000 bar High Pressure Connections (E)

Nova Part No.	Tube O.D. Ø Inch (mm)	Tube I.D. Ø mm (inch)	A mm (inch)	B mm (inch)	C Left handed	Pressure Connection
TBG1004	1/4 (6.4)	1.6 (0.06)	2.5 (0.1)	14.3 (0.56)	1/4-28 UNF	4E

Anti Vibration Connections (MPCT & HPTC / E):

For application with vibrations, Nova Swiss has developed anti-vibration connections, reducing and preventing to minimum, with additional radial seizure forces, the gland compression nut loosening. Anti-vibration assemblies are available for MPCT, HPCT and E tubing end-connections.

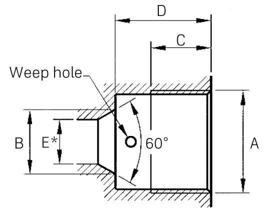


Pressure Connection Components

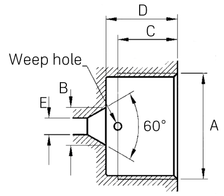
Nova Part No.	Tube O.D. Ø Inch (mm)	Collar Part No.		Gland Part No.		Anti-Vibro Assembly Part No.	
		Imperial	Metric	Imperial	Metric	Imperial	Metric
TBG109	9/16 (14.3)	COL-209-10P	n/a	GLN-209M-10P	n/a	AVA209M-10P	n/a
TBG1012	3/4 (19.1)	COL-2012-10P	n/a	GLN-2012M-10P	n/a	AVA2012M-10P	n/a
TBG1016	1 (25.4)	COL-2016-10P	n/a	GLN-2016M-10P	n/a	AVA2016M-10P	n/a
TBG204	1/4 (6.4)	COL-204-10P	n/a	GLN-204M-10P	n/a	AVA204M-10P	n/a
TBG206	3/8 (9.5)	COL-206-10P	n/a	GLN-206M-10P	n/a	AVA206M-10P	n/a
TBG209	9/16 (14.3)	COL-209-10P	n/a	GLN-209M-10P	n/a	AVA209M-10P	n/a
TBG2012	3/4 (19.1)	COL-2012-12P	n/a	GLN-2012M-10P	n/a	AVA2012M-10P	n/a
TBG2016	1 (25.4)	COL-2016-10P	n/a	GLN-2016M-10P	n/a	AVA2016M-10P	n/a
TBG302	1/8 (3.2)	520.1042	n/a	520.1041	n/a	n/a	n/a
TBG604	1/4 (6.4)	COL-604-10P	COL-604-10P	GLN-604H-10P	GLN-604E-10P	AVA604H-10P	AVA404E-10P
TBG606	3/8 (9.5)	COL-606-10P	COL-606-10P	GLN-606H-10P	GLN-606E-10P	AVA606H-10P	AVA406E-10P
TBG609	9/16 (14.3)	COL-609 -10P	COL-609 -10P	GLN-609H-10P	GLN-609E-10P	AVA609H-10P	AVA409E-10P
TBG1004	1/4 (6.4)	n/a	COL-704E-10P	n/a	GLN-704E-10P	n/a	AVA704E-10P

High-Pressure Port Connections

A female connection port is already available on high-pressure (MPCT, HPCT and E) fittings, valves etc. If a female port must be manufactured, port connections are to be prepared according to dimensional data (fig. MPCT, HPCT & E) for each tube dimension and pressure class.



MPCT



HPCT & E

10‘000 & 20‘000 psi MPCT Port Connections

Nova Part No.	Tube O.D. Ø Inch (mm)	A Thread	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	Pressure Connection
TBG109	9/16 (14.3)	13/16-16 UNF	13.0 (0.51)	12.0 (0.47)	19.1 (0.75)	9.1 (0.36)*	9M
TBG1012	3/4 (19.1)	3/4-14 NPSM	16.3 (0.64)	12.07 (0.50)	23.9 (0.94)	13.1 (0.52)*	12M
TBG1016	1 (25.4)	1-3/8-12 UNF	22.8 (0.90)	21.0 (0.83)	33.3 (1.31)	17.5 (0.69*	16M
TBG204	1/4 (6.4)	7/16-20 UNF	5.0 (0.20)	8.0 (0.31)	12.07 (0.50)	2.8 (0.11)	4M
TBG206	3/8 (9.5)	9/16-18 UNF	8.2 (0.32)	10.0 (0.39)	15.9 (0.63)	5.2 (0.20)	6M
TBG209	9/16 (14.3)	13/16-16 UNF	13.0 (0.51)	12.0 (0.47)	19.1 (0.75)	7.9 (0.31)	9M
TBG2012	3/4 (19.1)	3/4-14 NPSM	16.3 (0.64)	12.07 (0.50)	23.9 (0.94)	11.1 (0.44)	12M
TBG2016	1 (25.4)	1.3/8-12 UNF	22.8 (0.90)	21.0 (0.83)	33.3 (1.31)	14.3 (0.56)	16M

* Optional machining for 10000 psi, otherwise use TBG20xx corresponding tubing O.D. Ø dimensions.

60‘000 psi HPCT Port Connections

Nova Part No.	Tube O.D. Ø Inch (mm)	A Thread	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	Pressure Connection
TBG604	1/4 (6.4)	9/16-18 UNF	4.7 (0.19)	10.0 (0.39)	11.3 (0.44)	2.4 (0.09)	4H
TBG606	3/8 (9.5)	3/4-14 UNF	7.2 (0.28)	13.5 (0.53)	15.9 (0.63)	3.2 (0.13)	6H
TBG609	9/16 (14.3)	1.1/8-12 UNF	10.3 (0.41)	16.1 (0.63)	19.1 (0.75)	4.5 (0.18)	9H

4‘000 bar E Port Connections

Nova Part No.	Tube O.D. Ø Inch (mm)	A Thread	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	Pressure Connection
TBG604	1/4 (6.4)	M16x1.5	5.0 (0.20)	9.7 (0.38)	11.5 (0.45)	2.4 (0.09)	4E
TBG606	3/8 (9.5)	M20x1.5	7.0 (0.28)	13.5 (0.53)	15.0 (0.59)	3.2 (0.13)	6E
TBG609	9/16 (14.3)	M30x2	11.1 (0.43)	16.1 (0.63)	19.1 (0.75)	4.5 (0.18)	9E

7‘000 bar E Port Connections

Nova Part No.	Tube O.D. Ø Inch (mm)	A Thread	B mm (inch)	C mm (inch)	D mm (inch)	E mm (inch)	Pressure Connection
TBG1004	1/4 (6.4)	M16x1.5	5.0 (0.20)	9.7 (0.38)	11.5 (0.45)	2.4 (0.09)	4E

Tubing Specifications

Tubing TBG, straight nipples SNP & radius nipples RNP

General safety and warning rules

Adherence to specifications and observation of instructions is paramount for correct functioning and has therefore definitely to be assured by the user. Local environmental conditions should also be taken into consideration. The leak tight connection is directly depending on the experience of the user technician. Care must be taken that all users are trained, competent and handle connections correctly. High-pressure components have been designed according to the norms and regulations for pressure vessels and AD-files. If components are ordered in degreased conditions, contamination occurs during the assembly procedure must be avoided. If components are used in an explosive proof environment, specific tools are to be used.

Functional description and correct use

Tubing and nipples serve for pressure-tight circulation of fluids. No changes (mechanical alteration, welding, brazing, removal of marking, etc.) may be made on the tubing and nipples. Components are not to be used if they are damaged or have been exposed to high temperature (e.g. In case of fire). Tubing can be bent cold under observance of the limitations listed below. If the tubing is used for purposes other than those listed, neither the manufacturer nor the vendor shall be held liable for any resulting damage. Such risk shall be borne by the user only.

Temperature vs. Maximum Working Pressure

Nova Part No.	Pressure range at -50°C ...+30°C	Pressure range at +30°C ...+200°C	Pressure range at +200°C ...+300°C	Temperature range of the media *
TBG10xx	0...10‘000 psi (0...690 bar)	78%	68%	+50°C...+300°C
TBG20xx	0...20‘000 psi (0...1‘380 bar)			
TBG30xx	0...30‘000 psi (0...2‘080 bar)			
TBG60xx	0...60‘000 psi (0...4‘140 bar)			
TBG100xx	0...100‘000 psi (0...7‘000 bar)			

Ambient temperature: -50°C ... +65°C

When using a media that causes corrosion, mechanical changes (e.g. solid particles, etc.), as well as chemical destruction (e.g. H_2So_4, H_2, O_2, etc.) appropriate countermeasures must be taken (explosion protection) and if necessary the parts must be regularly examined and/or replaced. If flammable, explosive and/or toxic substances are used, the applicable statutory regulations are to be observed.

Tubing Specifications...continued

Bent Radius vs. Maximum Working Pressure

The tubing and nipples are designed predominantly for static service duty. In the case of dynamic loading appropriate measures must be taken by the user.

Nova Part No. RNP-xx-xx / TBG-xx-	Tube O.D. Ø Inch	Min. radius mm (inch)	Pressure range at -50°C ...+30°C	Pressure range at +30°C ...+200°C	Pressure range at +200°C ...+300°C
xxx109	9/1	67 (2.62)	92%	71%	62%
xxx1012	3/4	89 (3.50)			
xxx1016	1	117 (4.62)			
xxx204	1/4	32 (1.25)			
xxx206	3/8	44 (1.75)			
xxx209	9/16	67 (2.62)			
xxx2012	3/4	89 (3.50)			
xxx2016	1	117 (4.62)			
xxx604	1/4	32 (1.25)			
xxx606	3/8	44 (1.75)			
xxx609	9/16	67 (2.62)			
xxx1004	1/4	25 (0.98)			

Pressure Connections Assembly Torques

		Tubing O.D. Ø				
	Torque	1/4“	3/8“	9/16“	3/4“	1“
TBG10xx & TBG20xx series	Nm (ftlb)	15 (11)	35 (26)	75 (55)	145 (107)	310 (229)
TBG60xx series	Nm (ftlb)	30 (22)	65 (48)	145 (107)	-	-
TBG100xx series	Nm (ftlb)	45 (33)	-	-	-	-

Downloads

Download complete standard tubing specification HERE or scan QR code;

Download Instructions for imperial pressure-end connection (collars & Glands) HERE or scan QR code;

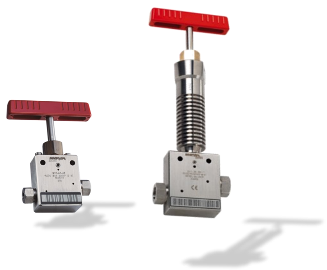
Download Instructions for metric pressure-end connection (collars & Glands) HERE or scan QR code;

Download Instructions for imperial anti-vibration pressure-end con-nection (collars & Glands) HERE or scan QR code;

Download Instructions for metric anti-vibration pressure-end con-nection (collars & Glands) HERE or scan QR code;

More Products From Nova Swiss

Manual Needle Valves



Manual valves are available in different body patterns with piping connections from 1/4" up to 1" and MAWP 100'000 psi (7'000 bar). All valves allow bi-directional, have a two-piece stem and are available also for extreme temperature applica-

Learn more, click NV

Actuated Needle Valves

All manual valves are available with normally open (-ATC) or normally closed (-ATO) actuation, allowing remote control and automatization.

Learn more, click AOV

Solenoid Valves

Solenoid valves incorporate highest quality and the smallest possible footprint and weight up to 14'500 psi (1'000 bar). Valves are available either normally closed (N.C.) or normally open (N.O.).

Learn more, click SP & SD & SOL

Check Valves

Check valves are available with piping connections from 1/4" up to 1" and MAWP 100'000 psi (7'000 bar). All valves are with semi-soft seat guaranteeing leak tight service.

Learn more, click CVP

Safety Valves

CE marked safety valves protect the circuit vs. over-pressurisation, available up to 65'000 psi (4'500 bar).

Learn more, click HPSV

Compressors

Diaphragm compressors up to 43'500 psi (3'000 bar) are available as bare compressors or as units ready-for-use for clean gases.

Learn more, click COMPRESSORS

Fittings and Adapters

A wide range of fittings and adapters, up to 1" piping connections, allow safe connection of high-pressure components and a leak free circuit.

Learn more, click FITTINGS

Systems

Nova Swiss develops and produces high-pressure systems that are precisely tailored to the customer's specifications. These are accompanied by comprehensive services such as support for on-site installations, commissioning, user training and servicing.

Learn more, click SYSTEMS

Accessories

Flexible hoses, gas boosters, pressure regulators, gauges, pressure– and temperature transducers are available, making the realisation of a projects easier, having only one partner to work with.

Learn more, CONTACT US

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IS NOVA

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