



PTFE AND STAINLESS STEEL HOSES

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DESCRIPTION

SAGANA® hoses guarantee the highest degree of safety. They are designed and certified in accordance with the latest standards in effect. SAGANA® hoses allow connection of piping systems and equipment under some of the most severe pressure and/or temperature conditions. They can be easily installed through the use of adapters. There are 4 types of hoses based upon their composition and use.

FX01 hoses consist of a PTFE inner tube and a stainless steel single or double braid.

FX02 hoses consist of a 316L stainless steel inner tube and a stainless steel single or double braid.

FX03 hoses consist of an antistatic PTFE inner tube with high pressure stainless steel reinforcement. A special abrasion resistant cover protects the hose from wear.

FX06 hoses consist of a 316L stainless steel inner tube and a stainless steel double braid.

SAGANA® hoses have a wide range of uses through the addition of various types of adapters of the SAGANA® instrumentation line of products.

We recommend a safety cable above 1 meter of length. The safety cable is optional.

All hoses are individually tested hydraulically at 1.5 times the maximum working pressure.

APPLICATIONS

SAGANA® FX01, FX02 and FX06 hoses were designed for efficiency, security and convenience. SAGANA® hoses are used for liquid and gas service or under ultra-vacuum in industries such as:

- chemical
- petrochemical
- gas
- energy
- paper mill
- research centers
- vacuum applications
- hydraulic systems
- pneumatic systems
- laboratories,
- etc...

SAGANA® FX03 hoses were designed and approved for CNG use in automotive applications

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FX01 | PTFE / STAINLESS STEEL HOSES

FX01

- FX01 hoses consist of a PTFE inner tube and a single or double-braided stainless steel on the outside.

STANDARD SPECIFICATIONS

- **Important notice** : By conception, FX01 flexibles have a restriction at every end since a nipple is inserted to perform the crimping. The table below summarizes the restrictions of the different flexible diameters.

- NICKEL standard for adapter seal washer.
- Others available upon request.
- see page 8 for service temperature

*Double braid **Single braid

FX01 PTFE / STAINLESS STEEL

Maximum Service Pressure	see table p G-10				
Interior dia.	6*, 10*, 16**, 20**, 25**mm (see page G-10)				
Standard overall length (mm)	minimum 350mm. Please indicate for order. Standard sizes are: 500, 750, 1000, 1250, 1500, 2000, 2500mm (adapter not included)				
Fluid compatibility	All liquids and gases compatible with PTFE and AISi 316L, except acetylene and combustive gases				
Max.Leak rate	10 ⁻³ mbar l s ⁻¹				
Temperature range	-50°C (-58°F) +230°C (446°F) for welded connections				
Materials					
Interior	PTFE				
Braid	Stainless steel AISi 304				
Fittings	Stainless steel AISi 316L				
DN (mm)	6	10	16	20	25
Restriction dia. (mm)	3	6	12	14.7	21

FX02 | STAINLESS STEEL HOSES

FX02

- FX02 hoses are high pressure hoses and consist of a 316L stainless steel corrugated inner tube and 304 stainless steel single or double-braided on the outside.

STANDARD SPECIFICATIONS

- NICKEL gasket standard for adapter seal washer.
- Others available upon request.

*Double braid **Single braid

FX02 STAINLESS STEEL

Maximum Service Pressure	see table p G-10				
Interior dia.	6*, 10*, 16**, 20**, 25**mm(see page G-10)				
Standard overall length (mm)	minimum 350mm. Please indicate for order. Standard sizes are: 500, 750, 1000, 1250, 1500, 2000, 2500mm (adapter not included)				
Fluid compatibility	All liquids and gases compatible with AISi 316L except acetylene				
Max.Leak rate	10-8 mbar l s ⁻¹				
Temperature range	-270°C(-454°F) , +550°C(1022°F)				
Materials					
Interior	Stainless steel AISi 316L				
Braid	Stainless steel AISi 304				
Fittings	Stainless steel AISi 316L				

FX03 | PTFE / ELASTOMERE HOSES

FX03

- FX03 hoses consist of a PTFE inner tube and an elastomere covered stainless steel structure on the outside. For automotive CNG applications.

STANDARD SPECIFICATIONS

- **Important notice** : By conception, FX01 flexibles have a restriction at every end since a nipple is inserted to perform the crimping. The table below summarizes the restrictions of the different flexible diameters.

- NICKEL standard for adapter seal washer.
- Others available upon request.
- see page 8 for service temperature

*Double braid **Single braid

FX03 PTFE / STAINLESS STEEL

Maximum Service Pressure	260 bar
Interior dia.	6, 10, 13 mm
Standard overall length (mm)	minimum 500mm. Please indicate for order. Standard sizes are: 500, 1000
Fluid compatibility	CNG
Temperature range	-40°C to +120°C

Materials	
Interior	Antistatic PTFE
Reinforcement	Stainless steel AiSi 304
End Fittings	Stainless steel
Cover	Elastomer
Connections	Acc. SAE J516

DN (mm)	6	10	16
Inner dia.(mm)	5,64	7,82	10,20
Outer dia.(mm)	9,90	12,44	15,62
Minimum bend radius (mm)	38,00	63,00	73,00

FX06 | STAINLESS STEEL HOSES

FX06

- FX06 hoses are medium pressure hoses and consist of a 316L stainless steel corrugated inner tube and 304 stainless steel double braid on the outside.

STANDARD SPECIFICATIONS

- NICKEL gasket standard for adapter seal washer.
- Others available upon request.

FX06 STAINLESS STEEL

Maximum Service Pressure	see table below
Interior dia.	¼", ⅜"
Standard overall length (mm)	minimum 350mm. Please indicate for order. Standard sizes are: 500, 750, 1000, 1250, 1500, 2000, 2500mm (adapter not included)
Fluid compatibility	All liquids and gases compatible with AiSi 316L except acetylene
Max. leak rate	10 ⁻⁸ mbar l/s ⁻¹
Temperature range	-270° C (-454° F) , +550° C (1022° F)

Materials	
Interior	Stainless steel AiSi 316L
Braid	Stainless steel AiSi 304
Fittings	Stainless steel AiSi 316L

DN (mm)	¼"	⅜"
Maximum service pressure (bar)	200	150
Inner dia.(mm)	6,3	10,2
Outer dia.(mm)	9,6	14,3
Minimum bend radius (mm)	30	42

SPECIFICATIONS

OPERATING PRESSURE

Relationship between inner tube diameter (DN) and maximum operating pressure at 20°C / 68°F in static mode.

FX01

PTFE / Stainless Steel		
Tube int. diam	Pressure max.	
DN 6	300 bar	4351 psi
DN 10	200 bar	2900 psi
DN 16	125 bar	1812 psi
DN 20	100 bar	1450 psi
DN 25	80 bar	1160 psi

FX02

Stainless Steel		
Tube int. diam	Pressure max.	
DN 6	360 bar	5221 psi
DN 10	240 bar	3480 psi
DN 16	85 bar	1232 psi
DN 20	80 bar	1160 psi
DN 25	70 bar	1015 psi

TEMPERATURE

FX01: For applications at temperatures between 204°C (400°F) and 230°C (445°F), the maximum operating pressure should be reduced by 30% of the maximum operating pressure at ambient temperature.



For hoses with screwed connections (see page 04).
Contact us for applications above 300°C on type FX02.

FX02 and FX06: To determine the maximum pressure based upon temperature, use the coefficients in the table below.

FOR FX02 AND FX06 (STAINLESS STEEL)

temp.°C	20	50	100	150	200	250	300	350	400	450	500	550
temp.°F	68	122	212	302	392	482	572	662	752	842	932	1022
coefficient	1.00	0.90	0.73	0.67	0.61	0.58	0.53	0.51	0.50	0.49	0.47	0.47

Example: the maximum operating pressure of a fluid at a temperature of 150°C in a FX02 hose with a DN10 is 240bar x coef. 0.67 = 160.80 bar.

MOTION AND VIBRATIONS

FX02 and FX06: To determine the maximum pressure based upon dynamic structural loading, use the coefficients in the table below.

	No vibrations Slow and small movement	Little vibrations Uniform and repetitive movement	Strong vibrations Continuous movement
Uniform flow, slow and continuous	1	0,80	0,40
High and pulsed flow	0,80	0,64	0,32
Turbulent and discontinuous flow	0,40	0,32	0,16

MINIMUM BENDING RADIUS (mm - inch)

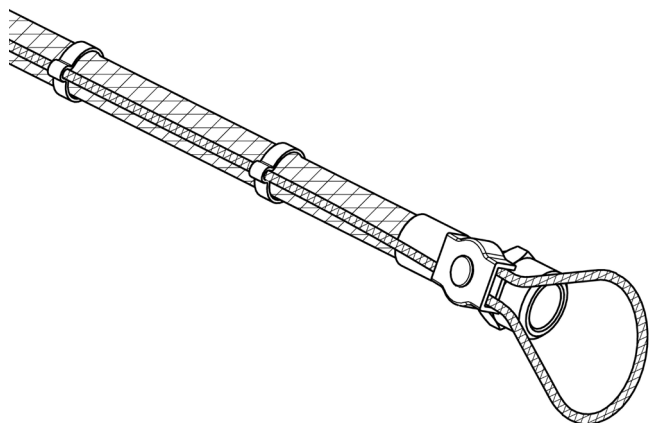
FX01

PTFE / Stainless Steel	
Tube int. diam	Static
DN 6	60 mm (2 3/8")
DN 10	120 mm (4 3/4")
DN 16	165 mm (6 1/2")
DN 20	190 mm (7 1/2")
DN 25	250 mm (9 7/8")

FX02

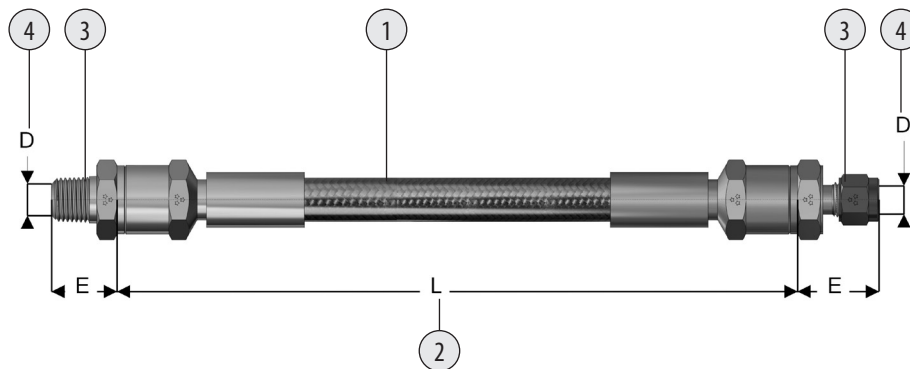
Stainless Steel		
Tube int. diam	Static	Dynamic
DN 6	30 mm (1 3/16")	190 mm (7 1/2")
DN 10	45 mm (1 3/4")	250 mm (9 7/8")
DN 16	58 mm (2 9/32")	225 mm (8 7/8")
DN 20	70 mm (2 3/4")	257 mm (10 1/8")
DN 25	85 mm (3 1/32")	293 mm (11 1/32")

SAFETY CABLE



Standard on the hoses for racks and Switch over boards (see page 15), the cable is optional for Type FX01 and FX02 hoses

SETTING A REFERENCE



1	2	3	4 5	6	4 5	6	7
FX(XX)	DN(YY)	(LLLL)	(AA)(ZZZ)	(T)	(AA)(ZZZ)	(T)	(E)
FX01 - PTFE/ Stainless Steel	Nominal diameter of the hose	Length of hose without adapter. In mm or ..." for inches	Type and diameter of 1st adapter (see p. 12-13) AAM - for metric system AA - for inches	Thread	Type and diameter of 2nd adapter (see pages 12-13) AAM - for metric system AA - for inches	Thread	Options
FX02 - All Stainless Steel							

1	2	3	4	5	6	7	
Type (FX)	inner diameter (DN..)	Length (LLLL)	Type of connection* (AA)	Size of connection (ZZZ)	Thread (T)	Options** (E)	
FX01 (=PTFE/SS)	6	Standard***:	Tube fitting	RB	6 mm	NPT	N C= cable
FX02 (=SS)	10	0350 mm	Female pipe adapter	UF	8 mm	BSPT	T A= NA****
FX03	13	0500 mm	Male pipe adapter	UM	10 mm	BSPP-RP	G
FX06	16	1000 mm	Butt weld	BW	12 mm	NA****	A
	20	1500 mm	Tube adapter	ADB	16 mm		
	25	2000 mm	Female Gazel fitting	RVF	20 mm		
		2500 mm	Male Gazel fitting	RVM	25 mm		
	1/4"						
	3/8"	12"			1/4"		
		24"			3/8"		
		36"			1/2"		
		48"			3/4"		
		60"			1"		

EXAMPLE

Ref.: FX01\DN06\1000\ADB6\UM1/4\T\C

is a hose with the following characteristics:

- PTFE tube, SS304 braid.
- Length without adapters: 1000 mm
- Connections: 6 mm adapter for tube fitting on one side and 1/4" male BSPT on the other side.
- Safety cable.

* see pages 12 and 13 for further information on adapters
 ** C = safety cable recommended of at least 1 meter
 *** other lengths available upon request
 **** NA=non applicable



CONNECTIONS (BASED UPON SIZE)

For other specifications, contact us

FX01

		METRIC								FRACTIONAL							
Nominal Diameter (DN)		6 mm		10 mm		16 mm		20 mm		25 mm		6 mm	10 mm	16 mm	20 mm	25 mm	
Connection Diameter		6	8	8	10	12	16	18	20	25	1/4"	3/8"	1/2"	1/2"	3/4"	1"	
		DOUBLE BRAID				SINGLE BRAID				DOUBLE BRAID			SINGLE BRAID				
PTFE / Stainless Steel	RB	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	UF										X	X	X	X	X	X	X
	UM										X	X	X	X	X	X	X
	ADB	X	X	X	X	X			X		X	X	X	X	X	X	X

X = Standard. Others on request

FX02

		METRIC								FRACTIONAL								
Nominal Diameter (DN)		6 mm		10 mm		16 mm		20 mm		25 mm		6 mm	10 mm	16 mm	20 mm	25 mm		
Connection Diameter		6	8	8	10	12	16	18	20	25	1/4"	3/8"	1/2"	1/2"	3/4"	3/4"	1"	
		DOUBLE BRAID				SINGLE BRAID				DOUBLE BRAID			SINGLE BRAID					
Stainless Steel	RB	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X
	UF										X	X	X	X			X	X
	UM										X	X	X	X			X	X
	RVF											X						X
	RVM											X						X
	BW											X						X
	ADB	X	X	X	X	X			X		X	X	X	X	X	X	X	X

X = Standard. Others on request

FX06

		METRIC				FRACTIONAL		
Nominal Diameter (DN)		1/4"		3/8"		1/4"	3/8"	3/8"
Connection Diameter		6	8	8	10	1/4"	3/8"	1/2"
Stainless Steel	RB	X	X	X	X	X	X	X
	UF					X	X	X
	UM					X	X	X
	RVF					X		X
	RVM					X		X
	BW					X		X
ADB	X	X	X	X	X	X	X	

X = Standard. Others on request

TYPES OF STANDARD THREADS (BASED UPON SIZE)

TAPERED THREADS

- N : NPT** National Pipe Tapered seal is made on the thread. Thread sealant is required
- T : BSPT** (Whitworth conical) RT to ISO 7/1. BS 21, JIS B0203, DIN 2999
Seal is made on the thread. Thread sealant is required

STRAIGHT OR PARALLEL THREADS

- G : BSPP** Whitworth cylindrical RP to ISO228/1, BS 2779, JIS B0202
Metal-to-metal sealing to DIN 3852, Form B. O-ring sold separately
- K : BSPP** Whitworth cylindrical RS to ISO 228/1, BS 2779, JIS B0202
Utilizes a sealing washer to provide sealing.
Reference DIN 3852 Form A. O-ring sold separately

MALE UNION

	1/4"	3/8"	1/2"	3/4"	1"
NPT	X	X	X	X	X
BSPT	X	NS	X	X	X
G or RP	X	X	X	X	X

FEMALE UNION

	1/4"	3/8"	1/2"	3/4"	1"
NPT	X	X	X	X	NS
BSPT	X	NS	X	NS	NS
G or RP	X	X	X	X	X

GASKET TYPES*

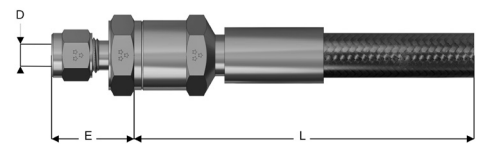
TYPE	WASHER MATERIAL
FX01 & FX02	Nickel standard, other request

*used with screwed connections

JOINT SCREW-TYPE FITTINGS

TUBE FITTING

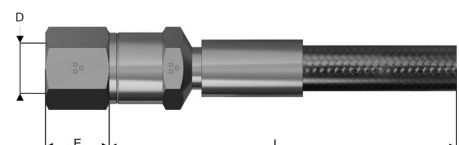
- RB**
- Type: FX01 & FX02
 - Dimensions: 6, 8, 10, 12, 16, 18, 20, 25 mm
 - 1/4", 3/8", 1/2", 3/4", 1"



FEMALE PIPE ADAPTER NPT-BSPT-BSPP

(SEE TABLE OF STANDARD THREADS ON P.11)

- UF**
- Type: FX01 & FX02
 - Dimensions: 1/4", 3/8", 1/2", 3/4", 1"



NOTE: For threads BSPP 1/8", 1/4", 3/8", 1/2", 3/4", 1", there is no screwed-on adapter or washer.

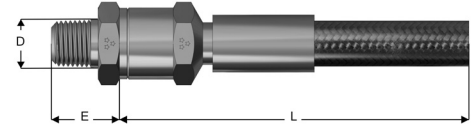
CONNECTION DESCRIPTION

MALE PIPE ADAPTER NPT-BSPT-BSPP

(SEE TABLE OF STANDARD THREADS ON P. 04)

UM

- Type: FX01 & FX02
- Dimensions:
1/4", 3/8", 1/2", 3/4", 1"

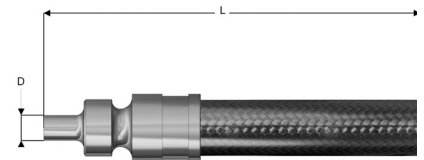


WELDED CONNECTIONS

BUTTWELD

BW

- Type: FX02
- Dimensions:
1/4", 1/2", 3/4", 1"

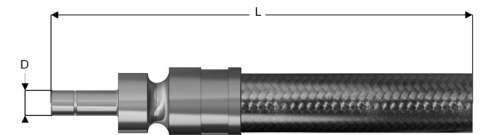


TUBE ADAPTER

ADB

- Type: FX01 & FX02
- Dimensions:
6, 8, 10, 12, 18, 25 mm
1/4", 3/8", 1/2", 3/4", 1"

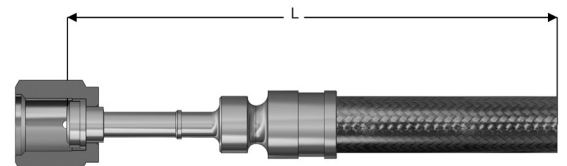
Each connector from our "Tube Fitting" catalog can be mounted on the type AD Tube adapter to obtain any desired connection "male or female, with any thread type and configuration (elbow, tee,...)"



GAZEL FITTING (FACE SEAL) FEMALE

RVF

- Type: FX02
- Dimensions:
1/4", 1/2", 3/4", 1"



GAZEL FITTING (FACE SEAL) MALE

RVM

- Type: FX02
- Dimensions:
1/4", 1/2", 3/4", 1"

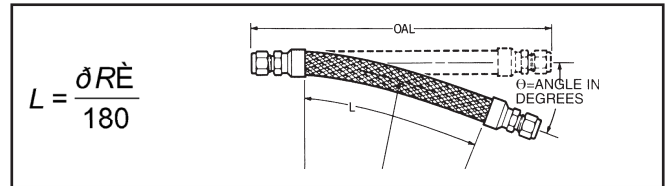


DETERMINING THE EFFECTIVE LENGTH BASED UPON TYPE OF MOTION

ANGULAR MOTION

In the event that an end is fixed and the other end bends following a simple curve while ends are not parallel.

- L = effective length
- R = axis bend radius
- Θ = bending angle (degrees)
- π = 3.14



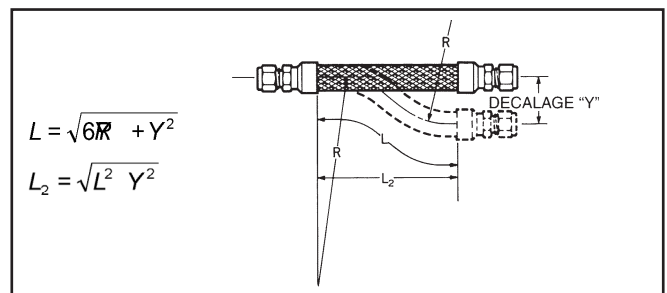
OFFSET MOTION

In the event that one end of the hose bends perpendicularly to the longitudinal axis while ends are parallel without resulting in torsion stress.

- L = effective length of hose for zero offset
- R = axis bend radius
- Y = axis offset, more or less.

Note:

- In the event that the offset occurs on both sides of the axis, the effective length of the hose should be calculated based upon the total motion or twice Y.
- The two conditions L and L₂ must be met. In case of intermittent or continuous motion, Y should never exceed 25% of the minimum intermittent bend radius.



RADIAL MOTION:

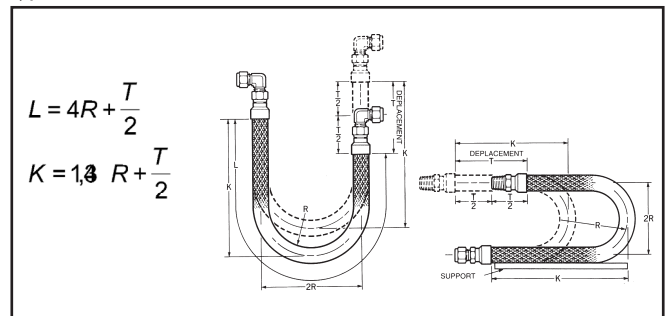
Type A - Formula of motion loop
Type B - Formula of motion loop

- T = total motion
- L = effective length of hose
- R = axis bend radius
Should not be lower than the one indicated in the table on page 6.
- K = loop length

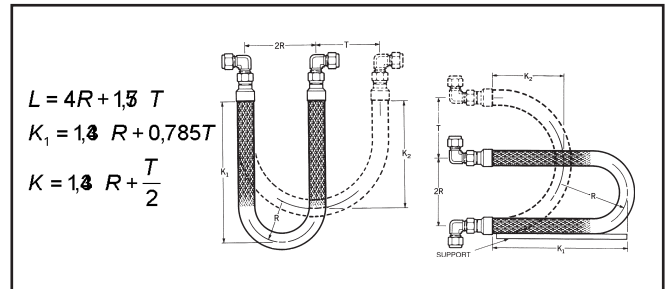
Note:

In the units with a loop, the hose and motion should be on the same plane as the bending.

Type A



Type B



LINE OF PRODUCTS FOR RACKS AND SWITCH OVER BOARDS

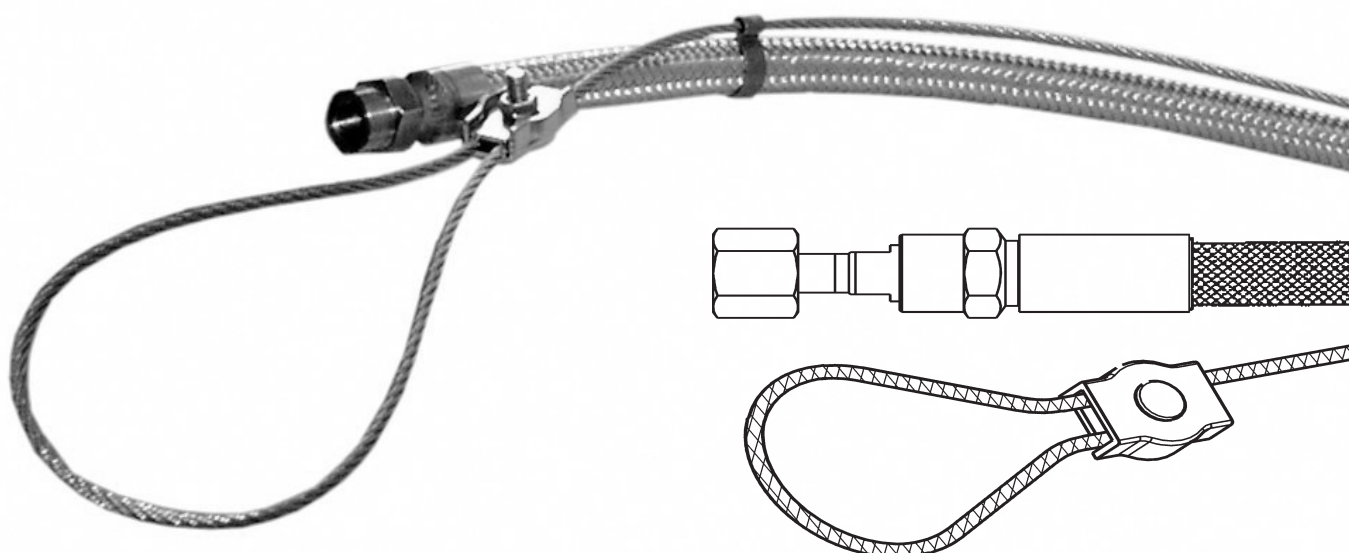
A special line of hoses has been designed for high-pressure applications and for connection with cylinders, switch over boards and modules.

DESCRIPTION

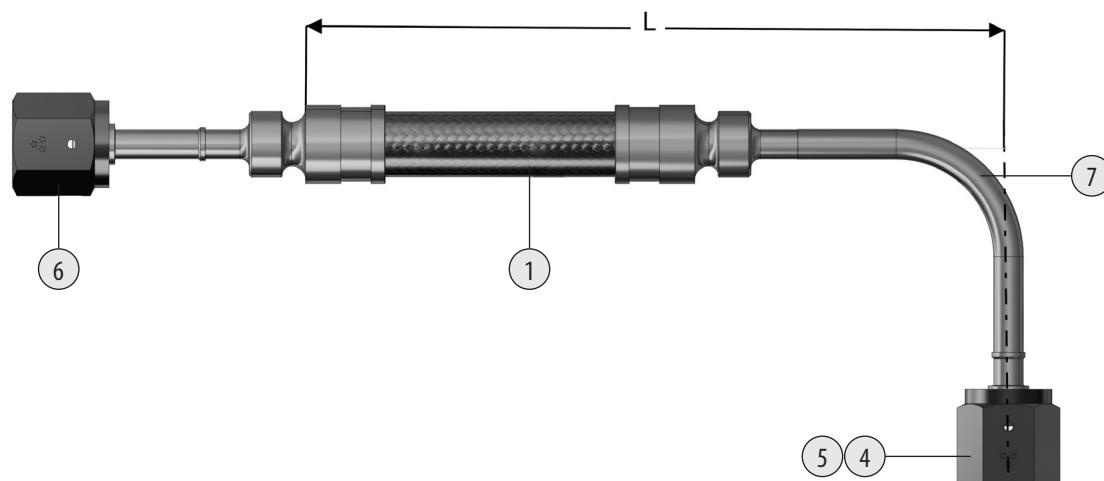
This line of products features nonsymmetrical hoses equipped with a manual cylinder adapter in accordance with the existing standards at one end and a standard female G3/8-type adapter at the other end. Upon request, both ends may come with a 90° elbow.

This line of products is available in the two versions previously described as FX01 and FX02 and has the same specifications (material, pressure, temperature). It is available in standard DN06 and DN10.

Each hose is equipped with a standard safety cable.



ORDERING INFORMATION



① FX(XX)	② DN(YY)	③ (LLLL)	④ (AAA)	⑤ (ZZZ)	⑥ (BB)	⑦ (E)
Hose type	Nominal diameter of the hose	Length of hose in mm	Norm of the cylinder connection	Nr or type of cylinder connection	Female connection	Position of the elbow

XXXXXX

1 (XX)	2 (YY)*	3 (LLLL)**	4 (AAA)***	5 (ZZZ)	6 (BB)****	7 (E)			
01 = PTFE & Stainless Steel	01	06	1000	Belgian norm	NBN	G 3/8 female écrou tournant	G6	No elbow	N
02 = Stainless Steel	02	10	1500	French norm	NF	1/4 NPT female	T4	coude côté raccord bouteille	B
			2500	British standard	BS	3/8 NPT female	T6	coude côté écrou tournant	S
				American standard	CGA				
				German Norm	DIN				

EXAMPLE

REF : FX02\DN06\1000\BS\3\G6\B

An all stainless steel hose of 1 meter with a nominal diameter of 6 mm, an elbow on the side of the cylinder connection for a BS341-3 no.3 cylinder and a G $\frac{3}{8}$ connection.

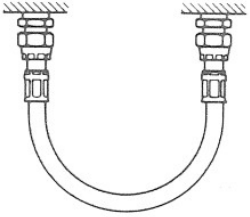
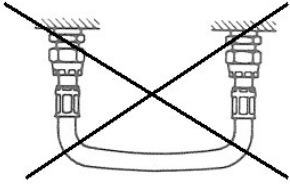

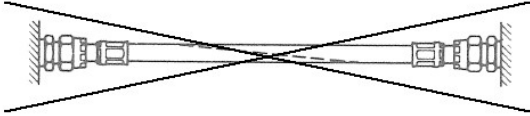
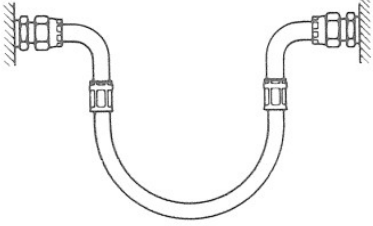
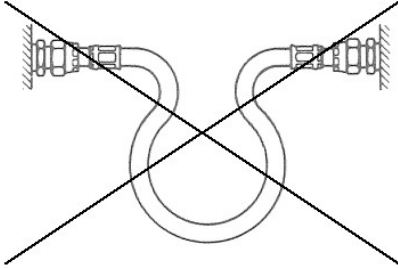
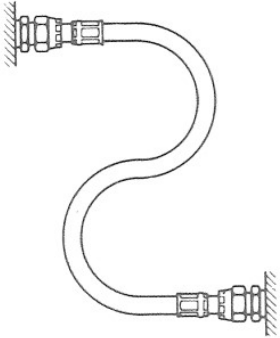
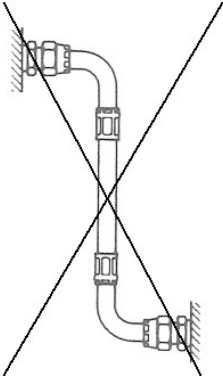
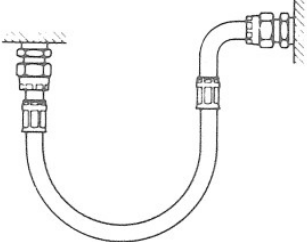
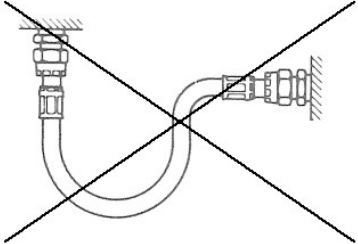
* Other nominal diameter upon request

** Other length upon request

*** Other norm upon request

**** Other type of connection upon request

INSTRUCTIONS FOR PROPER INSTALLATION

RIGHT	WRONG
	
	
	
	
	

TECHNICAL DATA

UNITS

1 bar	=	14,50 psi	=	100 kPa.
1 psi	=	0.069 bar	=	6,89 kPa
1 kPa (ISO)	=	0.01 bar	=	0,1451 psi
1 Kg/cm ²	=	0.980 bar	=	14,22 psi = 98 kPa
T° C (C : Celsius)	=	(T°F - 32) / 1.8	=	T°K - 273,15
T° F (F : Fahrenheit)	=	(1.8 x T°C) + 32	=	(1.8 x T°K) + 523,69
T° K (K : Kelvin)	=	T°C + 273.16	=	(T°F / 1.8) + 255,38
T° R (R : Rankine)	=	(1.8 x T°C) + 491.69	=	T°F + 459,69
1 inch	=	25.4 mm		
1 mm	=	0.045 inch		

NORMS TAPERED

Tapered (ISO 7/1)

NPT(National Pipe Tapered) NFE 03-601

BSPT (Whitworth) : NFE 03-004



Parallel (ISO228/1)

BSPP (Whitworth) : NFE 03-005



THREAD PRESSURE RATINGS - BRASS

MALE THREAD										
F	1/16"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Bar →	379	345	276	269	262	248	179	-	-	-
Psi →	5500	5000	4000	3900	3800	3600	2600	-	-	-

FEMALE THREAD										
F	1/16"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Bar →	227	221	227	179	165	159	152	-	-	-
Psi →	3300	3200	3300	2600	2400	2300	2200	-	-	-

THREAD PRESSURE RATINGS - STAINLESS STEEL 316L

MALE THREAD										
F	1/16"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Bar →	717	648	517	503	496	469	345	393	324	248
Psi →	10400	9400	7500	7300	7200	6800	5000	5700	4700	3600

FEMALE THREAD										
F	1/16"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Bar →	434	420	427	345	317	296	283	324	296	255
Psi →	6300	6100	6200	5000	4600	4300	4100	4700	4300	3700

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