

# Resato

HIGH PRESSURE TECHNOLOGY



## HIGH PRESSURE FITTINGS, ADAPTERS AND TUBING

High-pressure fittings, adapters and tubing up to 14,000 BAR / 200,000 PSI

Designed for use in systems that handle fluids and gases at extreme pressures and temperatures

Suitable for use with other Resato components (valves, pumps and boosters)

## CONTENT

Page	Description
------	-------------

- |   |                           |
|---|---------------------------|
| 1 | High-pressure connections |
| 2 | Ordering code system      |

### High pressure fittings

- |     |                                      |
|-----|--------------------------------------|
| 3-5 | Connections M16x1.5 and 9/16"-18 UNF |
|-----|--------------------------------------|

### High pressure adapters

- |   |   |
|---|---|
| 6 | Connections M16x1.5 and 9/16"-18 UNF male to:   |
| 7 | Connections M16x1.5 and 9/16"-18 UNF Female to: |

### High pressure fittings

- |      |                                     |
|------|-------------------------------------|
| 8-10 | Connections M20x1.5 and 3/4"-16 UNF |
|------|-------------------------------------|

### High pressure adapters

- |    |  |
|----|--|
| 11 | Connections M20x1.5 and 3/4"-16 UNF male to:   |
| 12 | Connections M20x1.5 and 3/4"-16 UNF Female to: |

### High pressure fittings

- |       |                                     |
|-------|-------------------------------------|
| 13-15 | Connections M30x2 and 1 1/8"-12 UNF |
|-------|-------------------------------------|

### High pressure adapters

- |    |  |
|----|--|
| 16 | Connections M30x2 and 1 1/8"-12 UNF male to:   |
| 17 | Connections M30x2 and 1 1/8"-12 UNF Female to: |

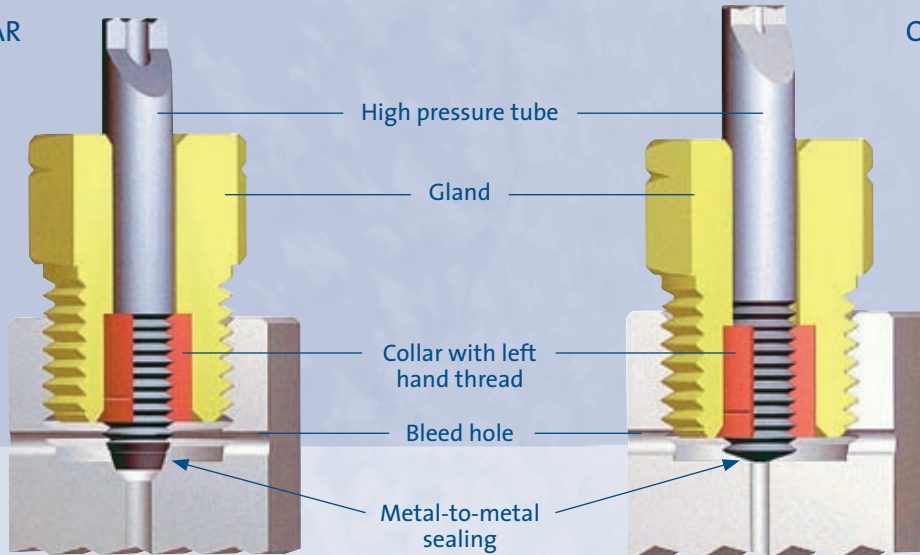
- |       |                      |
|-------|----------------------|
| 19-20 | High pressure tubing |
|-------|----------------------|



## HIGH PRESSURE CONNECTION

UP TO 7000 BAR

OVER 7000 BAR



High-pressure connections have an elastic metal-to-metal sealing. A complete connection consists of four parts: a high-pressure tube, a collar, a gland and a female part (tubing, valve or adapter).

For pressure higher than 7000 bar (100,000 psi) a flat cone sealing is used. The high-pressure tube with a male cone of 170° fits a 180° flat. The gland and the collar are identical to the 58°/60° connection. A bleed hole prevents pressure build-up behind the gland in case of a leak.

## COMPLETE RANGE OF FITTINGS AND ADAPTERS

Resato offers a complete range of fittings and adapters for high-pressure applications, specially designed to match the performance of our valves and tubing. We can supply fittings and adapters for virtually any configuration of systems designed for handling fluids and gases at extreme pressures and temperatures.

We have in stock a wide range of standard fitting and adapter types (refer to tables on the following pages); do not hesitate to contact us if you need fittings and adapters of a different design.

All fittings and adapters are marked with Resato logo, ordering code, material specification, pressure rating for which they can be used and material batch number (refers to DIN 3.1.B material certificate). The ordering codes for fittings and adapters contain information on connection type, O.D. size, body type and pressure rating.





## ORDERING CODE SYSTEM

### CONNECTION TYPES

The first number of the code (F or M) for fittings and adapters indicates the high-pressure connection type. A 'U' is added for UNF connection type (FU or MU). The 1, 2 or 3 after the first part of the code indicate the O.D. size of tubing that can be connected.

#### Code Connection

<b>F1</b>	M16 x 1.5 Female (6 mm and 1/4" O.D. tubing)
<b>FU1</b>	9/16" - 18 UNF Female (6 mm and 1/4" O.D. tubing)
<b>M1</b>	M16 x 1.5 Male (6 mm and 1/4" O.D. tubing)
<b>MU1</b>	9/16" - 18 UNF Male (6 mm and 1/4" O.D. tubing)
<b>F2</b>	M20 x 1.5 Female (10 mm and 3/8" O.D. tubing)
<b>FU2</b>	3/4" - 16 UNF Female (10 mm and 3/8" O.D. tubing)
<b>M2</b>	M20 x 1.5 Male (10 mm and 3/8" O.D. tubing)
<b>MU2</b>	3/4" - 16 UNF Male (10 mm and 3/8" O.D. tubing)
<b>F3</b>	M30 x 2 Female (14 mm and 9/16" O.D. tubing)
<b>FU3</b>	1 1/8" - 12 UNF Female (14 mm and 9/16" O.D. tubing)
<b>M3</b>	M30 x 2 Male (14 mm and 9/16" O.D. tubing)
<b>MU3</b>	1 1/8" - 12 UNF Male (14 mm and 9/16" O.D. tubing)

### FITTING TYPES

For fittings the second item of the code indicates the type of the fitting

Code	Type	Code	Type
1	= Union	10	= Gland
2	= Elbow	11	= Collar
3	= Tee	12	= Gland plug
4	= Cross	13	= Plug
6	= Double Cross	14	= Cap

### ADAPTER TYPES

For adapters the second item is a three-letter code to identify size and type of the pipe-thread.

#### First letter Second letter Third letter

<b>A</b> = 1/4"	<b>F</b> = Female	<b>S</b> = BSP (straight)
<b>B</b> = 3/8"	<b>M</b> = Male	<b>T</b> = NPT (tapered)
<b>C</b> = 1/2"		<b>H</b> = Male BSP for hose swivel connections
		<b>G</b> = Gauge conn.

### FITTING AND ADAPTER PRESSURE RATINGS

The last part of the ordering code indicates the pressure rating for which the fitting or adapter can be used.

#### Code

<b>07</b>	=	700	bar	/	10,000	psi
<b>10</b>	=	1000	bar	/	15,000	psi
<b>16</b>	=	1600	bar	/	23,000	psi
<b>21</b>	=	2100	bar	/	30,000	psi
<b>42</b>	=	4200	bar	/	60,000	psi
<b>70</b>	=	7000	bar	/	100,000	psi
<b>100</b>	=	10,000	bar	/	150,000	psi
<b>140</b>	=	14,000	bar	/	200,000	psi

Pressure ratings are based on room temperature. For temperatures lower than -20°C or higher than 80°C consult Resato.

The codes are to be used for ordering of standard fittings and adapters. Refer to the tables on the following pages for complete ordering codes.

### NACE MR-01-75

On request most fittings and adapters are available to NACE MR-01-75 for sour gas service. In this case a 'SG' will be added to the ordering code.

### MATERIALS

For pressures up to 7000 bar (100,000 psi) fitting and adapter bodies are made of cold drawn stainless steel, type DIN 1.4404 (316L); for higher pressures bodies are made of specially treated stainless steel 17-4PH. The glands are made of stainless steel, type DIN 1.4104 (430F). The collar is made of stainless steel, type DIN 1.4122.

### ORDERING A RESATO FITTING OR ADAPTER

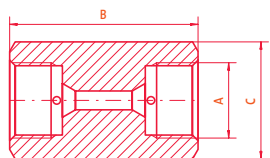
The ordering codes used in the tables on the following pages specify the connection size, body type and pressure range for which a fitting or adapter is designed. Look up the type of fitting or adapter you need and state the code for the fitting or adapter in your order.

## HIGH PRESSURE FITTINGS

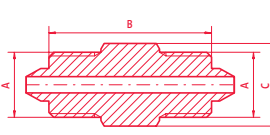
### Connections M16x1.5 and 9/16"-18 UNF

For tubing size 6 mm or 1/4" (O.D.)

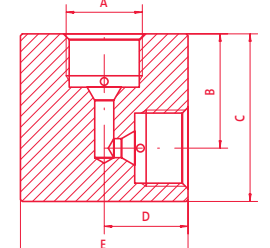
#### UNION (FEMALE)

	M16x1,5 (a)	9/16"-18 UNF (a)	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	Ordering code	Ordering code							
F1-1-42	FU1-1-42	FU1-1-42	4200 / 60,000	2.2	45	HEX. 22	-	-	-
F1-1-70	FU1-1-70	FU1-1-70	7000 / 100,000	2.2	45	HEX. 22	-	-	-
F1-1-100	FU1-1-100	FU1-1-100	10,000 / 150,000	1.6	45	HEX. 22	-	-	-
F1-1-140	FU1-1-140	FU1-1-140	14,000 / 200,000	1.0	45	HEX. 22	-	-	-

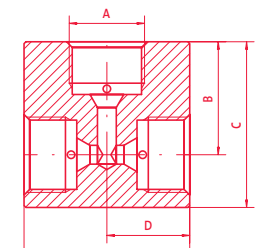
#### UNION (MALE)

	M16x1,5 (a)	9/16"-18 UNF (a)	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	Ordering code	Ordering code							
M1-1-42	MU1-1-42	MU1-1-42	4200 / 60,000	2.2	45	HEX.17	-	-	-
M1-1-70	MU1-1-70	MU1-1-70	7000 / 100,000	2.2	45	HEX.17	-	-	-
M1-1-100	M1-1-100	M1-1-100	10,000 / 150,000	1.6	45	HEX.22	-	-	-

#### ELBOW

	M16x1,5 (a)	9/16"-18 UNF (a)	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	Ordering code	Ordering code							
F1-2-42	FU1-2-42	FU1-2-42	4200 / 60,000	2.2	25	36	18	36	22
F1-2-70	FU1-2-70	FU1-2-70	7000 / 100,000	2.2	25	36	18	36	22
F1-2-100	FU1-2-100	FU1-2-100	10,000 / 150,000	1.6	25	36	18	36	22
F1-2-140	FU1-2-140	FU1-2-140	14,000 / 200,000	1.0	25	36	18	36	22

#### TEE

	M16x1,5 (a)	9/16"-18 UNF (a)	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	Ordering code	Ordering code							
F1-3-42	FU1-3-42	FU1-3-42	4200 / 60,000	2.2	25	36	18	36	22
F1-3-70	FU1-3-70	FU1-3-70	7000 / 100,000	2.2	25	36	18	36	22
F1-3-100	FU1-3-100	FU1-3-100	10,000 / 150,000	1.6	25	36	18	36	22
F1-3-140	FU1-3-140	FU1-3-140	14,000 / 200,000	1.0	25	36	18	36	22

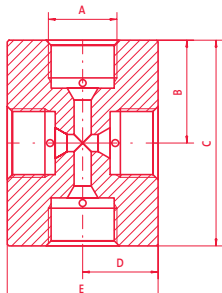
\*f = body thickness

## HIGH PRESSURE FITTINGS

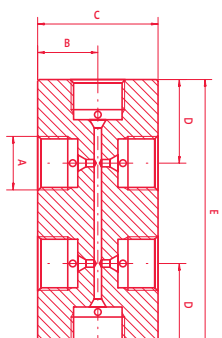
### Connections M16x1.5 and 9/16"-18 UNF

For tubing size 6 mm or 1/4" (O.D.)

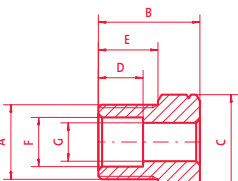
#### CROSS

	M16x1,5 (a) Ordering code	9/16"-18 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F1-4-42	FU1-4-42	4200 / 60,000	2.2	25	50	18	36	22
	F1-4-70	FU1-4-70	7000 / 100,000	2.2	25	50	18	36	22
	F1-4-100	FU1-4-100	10,000 / 150,000	1.6	25	50	18	36	22

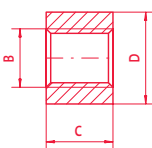
#### DOUBLE CROSS

	M16x1,5 (a) Ordering code	9/16"-18 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F1-6-42	FU1-6-42	4200 / 60,000	2.2	18	36	25	80	22
	F1-6-70	FU1-6-70	7000 / 100,000	2.2	18	36	25	80	22

#### GLAND

	M16x1,5 (a) Ordering code	9/16"-18 UNF (a) Ordering code	b mm	c mm	d mm	e mm	f mm	g mm
	M1-10	MU1-10	24	HEX.17	9	13	9.2	6.6

#### COLLAR

	M6x1-LH (b) Ordering code	1/4"-28 UNF-LH (b) Ordering code	For gland	c mm	d mm	e mm	f mm	g mm
	M1-11	MU1-11	M1-10	9 MU1-10	9	-	-	-

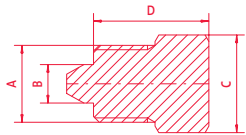
\*f = body thickness

## HIGH PRESSURE FITTINGS

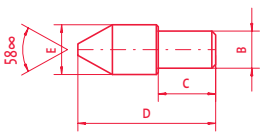
### Connections M16x1.5 and 9/16"-18 UNF

For tubing size 6 mm or 1/4" (O.D.)

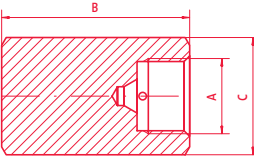
#### GLAND PLUG

	M16x1,5 (a) Ordering code	9/16"-18 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	M1-12-42 M1-12-70	MU1-12-42 MU1-12-70	4200 / 60,000 7000 / 100,000	6 6	HEX.17 HEX.17	24 24	- -	- -	- -

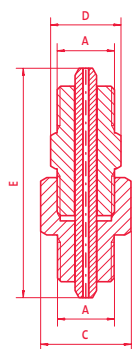
#### PLUG

	Ordering code	Pressure rating <sup>b</sup> For glandbar/psi	c mm	d mm	e mm	f mm	g mm	mm
	M1-13-100	M1-1010,000 / 150,000 MU1-10	6 15	30	9	-	-	-

#### CAP

	M16x1,5 (a) Ordering code	9/16"-18 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F1-3-42 F1-3-70 F1-3-100 F1-3-140	FU1-3-42 FU1-3-70 FU1-3-100 FU1-3-140	4200 / 60,000 7000 / 100,000 10,000 / 150,000 14,000 / 200,000	2.2 2.2 1.6 1.0	25 25 36 36	18 18 36 36	22 22 22 22		

#### SHORT CONNECTION

	M16x1,5 (a) Ordering code	9/16"-18 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	M1-SC-42 M1-SC-70 M1-SC-100 M1-SC-140	MU1-SC-42 MU1-SC-70 MU1-SC-100 MU1-SC-140	4200 /60,000 7000 /60,000 10,000 /150,000 14,000 /200,000	2.2 2.2 1.6 1.6	- - HEX.22 HEX.22	HEX.17 HEX.17	64 64 64 64		

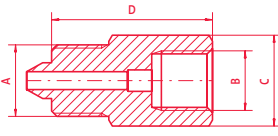
\*f = body thickness

## HIGH PRESSURE ADAPTERS

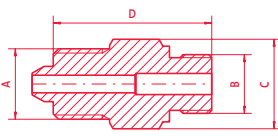
Connections M16x1.5 and 9/16"-18 UNF male to:

For tubing size 6 mm or 1/4" (O.D.)

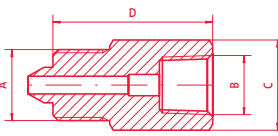
### BSP - FEMALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm
	Ordering code	Ordering code	bar/psi				
	1/4" BSP	M1-AFS-16	MU1-AFS-16	1600 / 23,000	2.2	HEX.22	45
	3/8" BSP	M1-BFS-10	MU1-BFS-10	1000 / 15,000	2.2	HEX.22	45
	1/2" BSP	M1-CFS-07	MU1-CFS-07	700 / 10,000	2.2	HEX.27	50

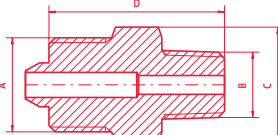
### BSP - MALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm
	Ordering code	Ordering code	bar/psi				
	1/4" BSP	M1-AMS-16	MU1-AMS-16	1600 / 23,000	2.2	HEX.22	45
	3/8" BSP	M1-BMS-10	MU1-BMS-10	1000 / 15,000	2.2	HEX.22	45
	1/2" BSP	M1-CMS-07	MU1-CMS-07	700 / 10,000	2.2	HEX.27	50

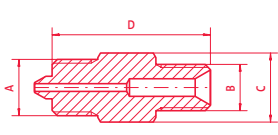
### NPT - FEMALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm
	Ordering code	Ordering code	bar/psi				
	1/4" NPT	M1-AFT-16	MU1-AFT-16	1600 / 23,000	2.2	HEX.22	45
	3/8" NPT	M1-BFT-10	MU1-BFT-10	1000 / 15,000	2.2	HEX.22	45
	1/2" NPT	M1-CFT-07	MU1-CFT-07	700 / 10,000	2.2	HEX.27	50

### NPT - MALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm
	Ordering code	Ordering code	bar/psi				
	1/4" NPT	M1-AMT-16	MU1-AMT-16	1600 / 23,000	2.2	HEX.17	45
	3/8" NPT	M1-BMT-10	MU1-BMT-10	1000 / 15,000	2.2	HEX.22	45
	1/2" NPT	M1-CMT-07	MU1-CMT-07	700 / 10,000	2.2	HEX.27	50

### HOSE CONNECTOR

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm
	Ordering code	Ordering code	bar/psi				
	1/4" BSP	M1-AMH-18	MU1-AMH-18	1800 / 26,000	2.2	HEX.17	45

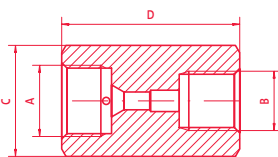
All adapters can be delivered as bulkhead adapters. In this case a 'B' has to be added to the ordering code. For example: **M1-BMS-10-B**. For dimensions please consult Resato.



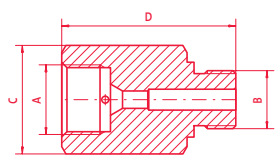
## HIGH PRESSURE ADAPTERS

Connections M16x1.5 and 9/16"-18 UNF Female to:  
For tubing size 6 mm or 1/4" (O.D.)

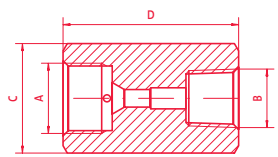
### BSP - FEMALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm	
	Ordering code	Ordering code	bar/psi					
	1/4" BSP	F1-AFS-16	FU1-AFS-16					1600 / 23,000
	3/8" BSP	F1-BFS-10	FU1-BFS-10					1000 / 15,000
1/2" BSP	F1-CFS-07	FU1-CFS-07	700 / 10,000					

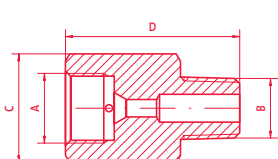
### BSP - MALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm	
	Ordering code	Ordering code	bar/psi					
	1/4" BSP	F1-AMS-16	FU1-AMS-16					1600 / 23,000
	3/8" BSP	F1-BMS-10	FU1-BMS-10					1000 / 15,000
1/2" BSP	F1-CMS-07	FU1-CMS-07	700 / 10,000					

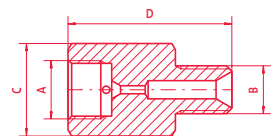
### NPT - FEMALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm	
	Ordering code	Ordering code	bar/psi					
	1/4" NPT	F1-AFT-16	FU1-AFT-16					1600 / 23,000
	3/8" NPT	F1-BFT-10	FU1-BFT-10					1000 / 15,000
1/2" NPT	F1-CFT-07	FU1-CFT-07	700 / 10,000					

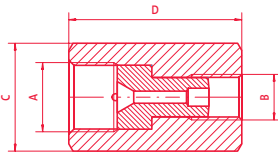
### NPT - MALE

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm	
	Ordering code	Ordering code	bar/psi					
	1/4" NPT	F1-AMT-16	FU1-AMT-16					1600
	3/8" NPT	F1-BMT-10	FU1-BMT-10					1000
1/2" NPT	F1-CMT-07	FU1-CMT-07	700					

### HOSE CONNECTOR

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm
	Ordering code	Ordering code	bar/psi				
1/4" BSP	F1-AMH-18	FU1-AMH-18	1800 / 26,000				

### GAUGE CONNECTION

	connection (b)	M16x1.5 (a)	9/16"-18 UNF (a)	Pressure rating	Orifice mm	c mm	d mm	
	Ordering code	Ordering code	bar/psi					
	1/4" BSP	F1-AFG-42	FU1-AFG-42					4200 / 60,000
	1/2" BSP	F1-CFG-42	FU1-CFG-42					4200 / 60,000

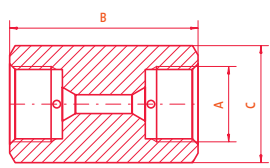
All adapters can be delivered as bulkhead adapters. In this case a 'B' has to be added to the ordering code. For example: M1-BMS-10-B. For dimensions please consult Resato.

## HIGH PRESSURE FITTINGS

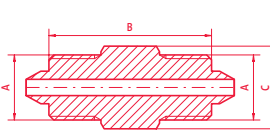
### Connections M20x1.5 and 3/4"-16 UNF

For tubing size 10 mm or 3/8" (O.D.)

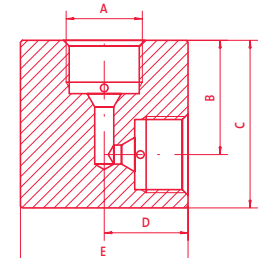
#### UNION (FEMALE)

	M20x1.5 (a)	3/4"-16 UNF (a)	Pressure rating	Orifice	b	c	d	e	f*
	Ordering code	Ordering code	bar/psi	mm	mm	mm	mm	mm	mm
	F2-1-21	FU2-1-21	2100 / 30,000	5.0	50	HEX.27	-	-	-
	F2-1-42	FU2-1-42	4200 / 60,000	3.5	50	HEX.27	-	-	-
F2-1-70	FU2-1-70	7000 / 100,000	2.2	50	HEX.27	-	-	-	

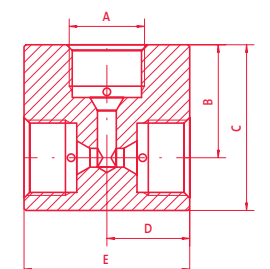
#### UNION (MALE)

	M20x1.5 (a)	3/4"-16 UNF (a)	Pressure rating	Orifice	b	c	d	e	f*
	Ordering code	Ordering code	bar/psi	mm	mm	mm	mm	mm	mm
	M2-1-21	MU2-1-21	2100 / 30,000	5.0	45	HEX.22	-	-	-
	M2-1-42	MU2-1-42	4200 / 60,000	3.5	45	HEX.22	-	-	-
M2-1-70	MU2-1-70	7000 / 100,000	2.2	45	HEX.22	-	-	-	

#### ELBOW

	M20x1.5 (a)	3/4"-16 UNF (a)	Pressure rating	Orifice	b	c	d	e	f*
	Ordering code	Ordering code	bar/psi	mm	mm	mm	mm	mm	mm
	F2-2-21	FU2-2-21	2100 / 30,000	5.0	30	44	22	44	26
	F2-2-42	FU2-2-42	4200 / 60,000	3.5	30	44	22	44	26
F2-2-70	FU2-2-70	7000 / 100,000	2.2	30	44	22	44	26	

#### TEE

	M20x1.5 (a)	3/4"-16 UNF (a)	Pressure rating	Orifice	b	c	d	e	f*
	Ordering code	Ordering code	bar/psi	mm	mm	mm	mm	mm	mm
	F2-3-21	FU2-3-21	2100 / 30,000	5.0	30	44	22	44	26
	F2-3-42	FU2-3-42	4200 / 60,000	3.5	30	44	22	44	26
F2-3-70	FU3-3-70	7000 / 100,000	2.2	30	44	22	44	26	

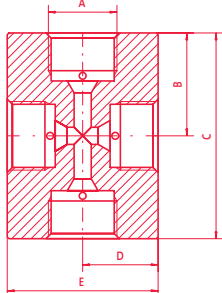
\*f = body thickness

## HIGH PRESSURE FITTINGS

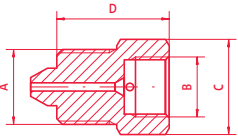
### Connections M20x1.5 and 3/4"-16 UNF

For tubing size 10 mm or 3/8" (O.D.)

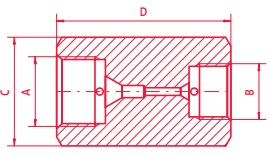
#### CROSS

	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F2-4-21	FU2-4-21	2100 / 30,000	5.0	30	76	22	44	26
	F2-4-42	FU2-4-42	4200 / 60,000	3.5	30	76	22	44	26
	F2-4-70	FU2-4-70	7000 / 100,000	2.2	30	76	22	44	26

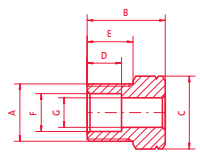
#### REDUCER GLAND

	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Connection (b) bar/psi	Pressure rating	Orifice mm	c mm	d mm	e mm
	M2-F1-42	MU2-F1-42	M16X1.5	4200 / 60,000	2.2	HEX.22	30	-
	M2-F1-70	MU2-F1-70	M16X1.5	7000 / 100,000	2.2	HEX.22	30	-
	M2-FU1-42	MU2-FU1-42	9/16"-18 UNF	4200 / 60,000	2.2	HEX.22	30	-
	M2-FU1-70	MU2-FU1-70	9/16"-18 UNF	7000 / 100,000	2.2	HEX.22	30	-
	M2-FU1-70	MU2-FU1-70	9/16"-18 UNF	7000 / 100,000	2.2	HEX.22	30	-

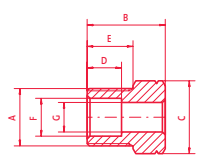
#### REDUCER BUSHING

	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Connection (b) bar/psi	Pressure rating	Orifice mm	c mm	d mm	e mm
	F2-F1-42	FU2-F1-42	M16X1.5	4200 / 60,000	2.2	HEX.27	50	-
	F2-F1-70	FU2-F1-70	M16X1.5	7000 / 100,000	2.2	HEX.27	50	-
	F2-FU1-42	FU2-FU1-42	9/16"-18 UNF	4200 / 60,000	2.2	HEX.27	50	-
	F2-FU1-70	FU2-FU1-70	9/16"-18 UNF	7000 / 100,000	2.2	HEX.27	50	-

#### GLAND

	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	b mm	c mm	d mm	e mm	f mm	g mm
	M2-10	MU2-10	27	HEX.22	12	16	13.2	10.3

#### COLLAR

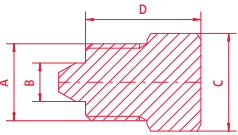
	M10x1-LH (b) Ordering code	3/8"-24 UNF-LH Ordering code	For gland	c mm	d mm	e mm	f mm	g mm
	M2-11	MU2-11	M2-10 MU2-10	12.5	13	-	-	-

## HIGH PRESSURE FITTINGS

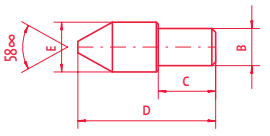
### Connections M20x1.5 and 3/4"-16 UNF

For tubing size 10 mm or 3/8" (O.D.)

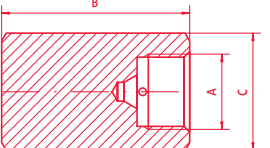
#### GLAND PLUG

	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	b mm	c mm	d mm	e mm	f mm
	M2-12-42 M2-12-70	MU2-12-42 MU2-12-70	4200 / 60,000 7000 / 100,000	10 10	HEX.22 HEX.22	27 27	- -	- -

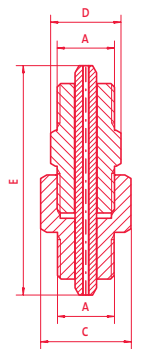
#### PLUG

	Ordering code	For gland	Pressure rating bar/psi	b mm	c mm	d mm	e mm	f mm
	M2-13-70	M2-10 MU2-10	7000 / 100,000	9.7	15	36	13	-

#### CAP

	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	b mm	c mm	d mm	e mm
	F2-14-42 F2-14-70	FU2-14-42 FU2-14-70	4200 / 60,000 7000 / 100,000	50 50	HEX.27 HEX.27	- -	- -

#### SHORT CONNECTION

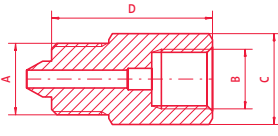
	M20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm
	M2-SC-21 M2-SC-42	MU2-SC-21 MU2-SC-42	2100 / 30,000 4200 / 60,000	5 3.5	- -	HEX.27 HEX.27	HEX.22 HEX.22	81 81



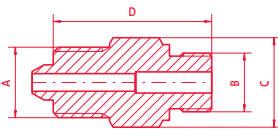
## HIGH PRESSURE ADAPTERS

Connections M20x1.5 and 3/4"-16 UNF male to:  
For tubing size 10 mm or 3/8" (O.D.)

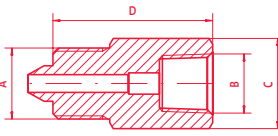
### BSP - FEMALE

	connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	M2-AFS-16	MU2-AFS-16	1600 / 23,000	5.0	HEX.22	45
3/8" BSP	M2-BFS-10	MU2-BFS-10	1000 / 15,000	5.0	HEX.22	45	
1/2" BSP	M2-CFS-07	MU2-CFS-07	700 / 10,000	5.0	HEX.27	50	

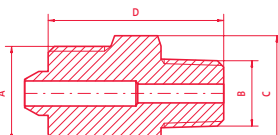
### BSP - MALE

	connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	M2-AMS-16	MU2-AMS-16	1600 / 23,000	5.0	HEX.22	45
3/8" BSP	M2-BMS-10	MU2-BMS-10	1000 / 15,000	5.0	HEX.22	45	
1/2" BSP	M2-CMS-07	MU2-CMS-07	700 / 10,000	5.0	HEX.27	50	

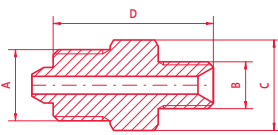
### NPT - FEMALE

	connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" NPT	M2-AFT-16	MU2-AFT-16	1600 / 23,000	5.0	HEX.22	45
3/8" NPT	M2-BFT-10	MU2-BFT-10	1000 / 15,000	5.0	HEX.22	45	
1/2" NPT	M2-CFT-07	MU2-CFT-07	700 / 10,000	5.0	HEX.27	50	

### NPT - MALE

	connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" NPT	M2-AMT-16	MU2-AMT-16	1600 / 23,000	5.0	HEX.22	45
3/8" NPT	M2-BMT-10	MU2-BMT-10	1000 / 15,000	5.0	HEX.22	45	
1/2" NPT	M2-CMT-07	MU2-CMT-07	700 / 10,000	5.0	HEX.27	50	

### HOSE CONNECTOR

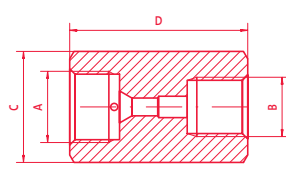
	connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	M2-AMH-18	MU2-AMH-18	1800 / 26,000	5.0	HEX.22	45

All adapters can be delivered as bulkhead adapters. In this case a 'B' has to be added to the ordering code. For example: M2-BMS-10-B. For dimensions please consult Resato.

## HIGH PRESSURE ADAPTERS

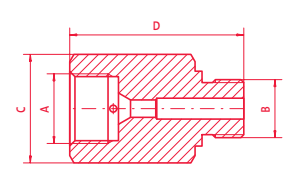
Connections M20x1.5 and 3/4"-16 UNF Female to:  
For tubing size 10 mm or 3/8" (O.D.)

### BSP - FEMALE



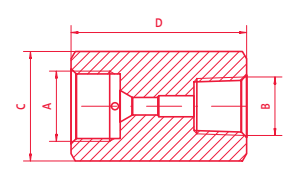
connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	M2-AFS-16	MU2-AFS-16	1600 / 23,000	5.0	HEX.22	45
3/8" BSP	M2-BFS-10	MU2-BFS-10	1000 / 15,000	5.0	HEX.22	45
1/2" BSP	M2-CFS-07	MU2-CFS-07	700 / 10,000	5.0	HEX.27	50

### BSP - MALE



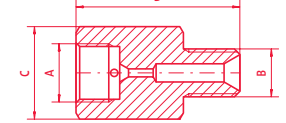
connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	F2-AMS-16	FU2-AMS-16	1600 / 23,000	5.0	HEX.27	50
3/8" BSP	F2-BMS-10	FU2-BMS-10	1000 / 15,000	5.0	HEX.27	50
1/2" BSP	F2-CMS-07	FU2-CMS-07	700 / 10,000	5.0	HEX.27	50

### NPT - FEMALE



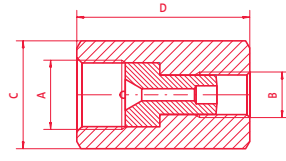
connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" NPT	F2-AFT-16	FU2-AFT-16	1600 / 23,000	5.0	HEX.27	50
3/8" NPT	F2-BFT-10	FU2-BFT-10	1000 / 15,000	5.0	HEX.27	50
1/2" NPT	F2-CFT-07	FU2-CFT-07	700 / 10,000	5.0	HEX.27	50

### HOSE CONNECTOR



connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	F2-AMH-18	FU2-AMH-18	1800 / 26,000	5.0	HEX.27	50

### GAUGE CONNECTION



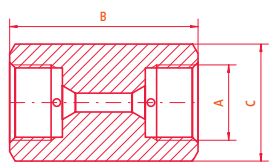
connection (b)	M 20x1.5 (a) Ordering code	3/4"-16 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	F2-AFG-42	FU2-AFG-42	4200 / 60,000	3.5	HEX.27	50
1/2" BSP	F2-CFG-42	FU2-CFG-42	4200 / 60,000	3.5	HEX.27	50

All adapters can be delivered as bulkhead adapters. In this case a 'B' has to be added to the ordering code.  
For example: **F2-BMS-10-B**. For dimensions please consult Resato.

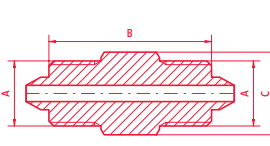
## HIGH PRESSURE FITTINGS

Connections M30x2 and 1 1/8"-12 UNF  
For tubing size 14 mm or 9/16" (O.D.)

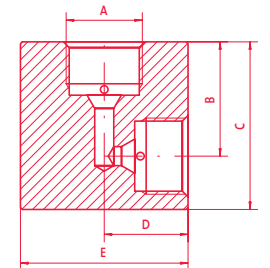
### UNION (FEMALE)

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F3-1-21	FU3-1-21		2100 / 30,000	8.0	56	HEX. 36	-	-
F3-1-42	FU3-1-42		4200 / 60,000	5.0	56	HEX. 36	-	-	-

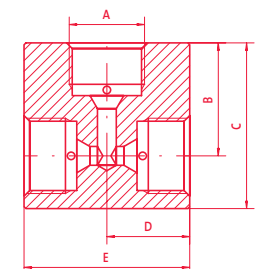
### UNION (MALE)

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	M3-1-21	MU3-1-21		2100 / 30,000	8.0	56	HEX.32	-	-
M3-1-42	MU3-1-42		4200 / 60,000	5.0	56	HEX.32	-	-	-

### ELBOW

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F3-2-21	FU3-2-21		2100 / 30,000	8.0	38	58	32	64
F3-2-42	FU3-2-42		4200 / 60,000	5.0	38	58	32	64	36

### TEE

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F3-3-21	FU3-3-21		2100 / 30,000	8.0	38	58	32	64
F3-3-42	FU3-3-42		4200 / 60,000	5.0	38	58	32	64	36

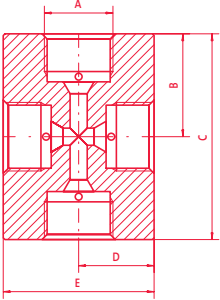
\*f = body thickness

## HIGH PRESSURE FITTINGS

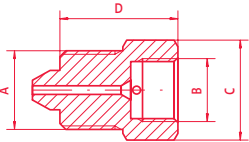
### Connections M30x2 and 1 1/8"-12 UNF

For tubing size 14 mm or 9/16" (O.D.)

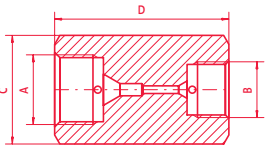
#### CROSS

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm	f* mm
	F3-4-21	FU3-4-21	2100 / 30,000	8.0	38	76	32	64	36
F3-4-42	FU3-4-42	4200 / 60,000	5.0	38	76	32	64	36	

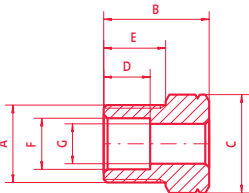
#### REDUCER GLAND

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm
	M3-F1-42	MU3-F1-42	M16X1.5	4200 / 60,000	2.2	HEX.32	32	-
M3-F2-21	MU3-F2-21	M20X1.5	2100 / 30,000	5	HEX.32	32	-	
M3-F2-42	MU3-F2-42	M20X1.5	4200 / 60,000	3.5	HEX.32	32	-	
M3-FU1-42	MU3-FU1-42	9/16"-18 UNF	4200 / 60,000	2.2	HEX.32	32	-	
M3-FU2-21	MU3-FU2-21	3/4"-16 UNF	2100 / 30,000	5	HEX.32	32	-	
M3-FU2-42	MU3-FU2-42	3/4"-16 UNF	4200 / 60,000	3.5	HEX.32	32	-	

#### REDUCER BUSHING

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	b mm	c mm	d mm	e mm
	F3-F1-42	FU3-F1-42	M16X1.5	4200 / 60,000	2.2	HEX.36	56	-
F3-F2-21	FU3-F2-21	M20X1.5	2100 / 30,000	5	HEX.36	56	-	
F3-F2-42	FU3-F2-42	M20X1.5	4200 / 60,000	3.5	HEX.36	56	-	
F3-FU1-42	FU3-FU1-42	9/16"-18 UNF	4200 / 60,000	2.2	HEX.36	56	-	
F3-FU2-21	FU3-FU2-21	3/4"-16 UNF	2100 / 30,000	5	HEX.36	56	-	
F3-FU2-42	FU3-FU2-42	3/4"-16 UNF	4200 / 60,000	3.5	HEX.36	56	-	

#### GLAND

	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	b mm	c mm	d mm	e mm	f mm	g mm
	M3-10	MU3-10	32	HEX.32	15	20	22.2	14.6

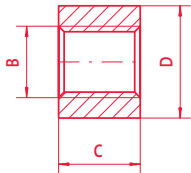
\*f = body thickness



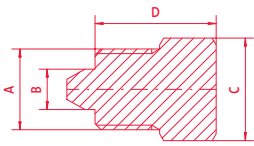
## HIGH PRESSURE FITTINGS

Connections M30x2 and 1 1/8"-12 UNF  
For tubing size 14 mm or 9/16" (O.D.)

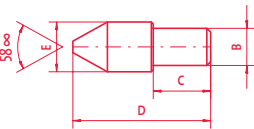
### COLLAR

	M14x1.5-LH (b) Ordering code	9/16"-18 UNF-LH Ordering code	For gland	c mm	d mm	e mm	f mm	g mm
	M3-11	MU3-11	M3-10 MU3-10	16	22	-	-	-

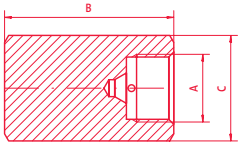
### GLAND PLUG

	M 30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	pressure rating Ordering code	b bar/psi	c mm	d	e	f	g
	M3-12-42	MU3-12-42	4200 / 60,000	14	HEX.32	32	-	-	-

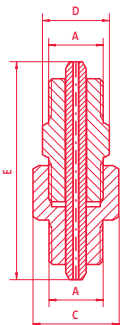
### PLUG

	Ordering code	for gland	pressure rating bar/psi	b mm	c mm	d mm	e mm	f mm	g mm
	M3-13-42	M3-10 MU3-10	4200 / 60,000	14	17	41	22	-	-

### CAP

	M 30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	b mm	c mm	d mm	e mm	f* mm
	F3-14-42	FU3-14-42	4200 / 60,000	56	HEX.36	-	-	-

### SHORT CONNECTION

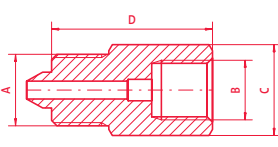
	M 30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	b mm	c mm	d mm	e mm	f* mm
	F3-14-42	FU3-14-42	4200 / 60,000		56	HEX.36	-	-

\*f = body thickness

## HIGH PRESSURE ADAPTERS

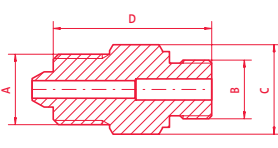
Connections M30x2 and 1 1/8"-12 UNF male to:  
For tubing size 14 mm or 9/16" (O.D.)

### BSP - FEMALE



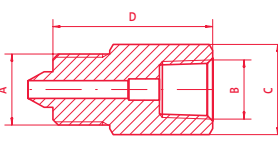
connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	M3-AFS-16	MU3-AFS-16	1600 / 23,000	5.0	HEX.32	56
3/8" BSP	M3-BFS-10	MU3-BFS-10	1000 / 15,000	6.0	HEX.32	56
1/2" BSP	M3-CFS-07	MU3-CFS-07	700 / 10,000	8.0	HEX.32	56

### BSP - MALE



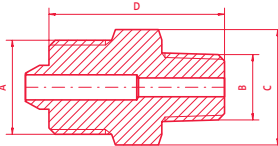
connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	M3-AMS-16	MU3-AMS-16	1600 / 23,000	5.0	HEX.32	56
3/8" BSP	M3-BMS-10	MU3-BMS-10	1000 / 15,000	6.0	HEX.32	56
1/2" BSP	M3-CMS-07	MU3-CMS-07	700 / 10,000	8.0	HEX.32	56

### NPT - FEMALE



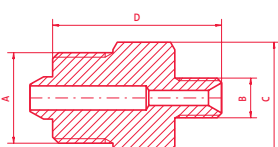
connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" NPT	M3-AFT-16	MU3-AFT-16	1600 / 23,000	5.0	HEX.32	56
3/8" NPT	M3-BFT-10	MU3-BFT-10	1000 / 15,000	6.0	HEX.32	56
1/2" NPT	M3-CFT-07	MU3-CFT-07	700 / 10,000	8.0	HEX.32	56

### NPT - MALE



connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" NPT	M3-AMT-16	MU3-AMT-16	1600 / 23,000	5.0	HEX.32	56
3/8" NPT	M3-BMT-10	MU3-BMT-10	1000 / 15,000	6.0	HEX.32	56
1/2" NPT	M3-CMT-07	MU3-CMT-07	700 / 10,000	8.0	HEX.32	56

### HOSE CONNECTOR



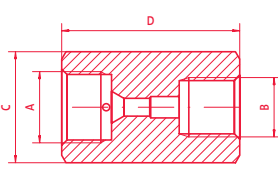
connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
1/4" BSP	M3-AMH-18	MU3-AMH-18	1800 / 26,000	5.0	HEX.32	56

All adapters can be delivered as bulkhead adapters. In this case a 'B' has to be added to the ordering code.  
For example: F3-BMS-10-B. For dimensions please consult Resato.

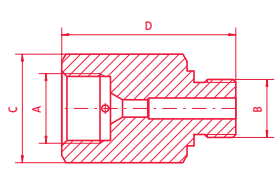
## HIGH PRESSURE ADAPTERS

**Connections M30x2 and 1 1/8"-12 UNF Female to:**  
For tubing size 14 mm or 9/16" (O.D.)

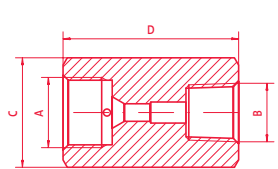
### BSP - FEMALE

	connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	F3-AFS-16	FU3-AFS-16	1600 / 23,000	5.0	HEX.36	56
	3/8" BSP	F3-BFS-10	FU3-BFS-10	1000 / 15,000	6.0	HEX.36	56
	1/2" BSP	F3-CFS-07	FU3-CFS-07	700 / 10,000	8.0	HEX.36	56

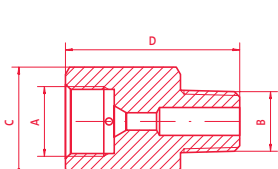
### BSP - MALE

	connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	F3-AMS-16	FU3-AMS-16	1600 / 23,000	5.0	HEX.36	56
	3/8" BSP	F3-BMS-10	FU3-BMS-10	1000 / 15,000	6.0	HEX.36	56
	1/2" BSP	F3-CMS-07	FU3-CMS-07	700 / 10,000	8.0	HEX.36	56

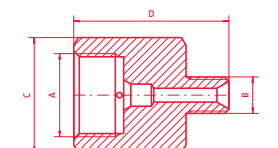
### NPT - FEMALE

	connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" NPT	F3-AFT-16	FU3-AFT-16	1600 / 23,000	5.0	HEX.36	56
	3/8" NPT	F3-BFT-10	FU3-BFT-10	1000 / 15,000	6.0	HEX.36	56
	1/2" NPT	F3-CFT-07	FU3-CFT-07	700 / 10,000	8.0	HEX.36	56

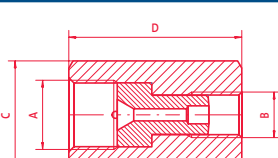
### NPT - MALE

	connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" NPT	F3-AMT-16	FU3-AMT-16	1600 / 23,000	5.0	HEX.36	56
	3/8" NPT	F3-BMT-10	FU3-BMT-10	1000 / 15,000	6.0	HEX.36	56
	1/2" NPT	F3-CMT-07	FU3-CMT-07	700 / 10,000	8.0	HEX.36	56

### HOSE CONNECTOR

	connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	F3-AMH-18	FU3-AMH-18	1800 / 26,000	5.0	HEX.36	56

### GAUGE CONNECTION

	connection (b)	M30x2 (a) Ordering code	1 1/8"-12 UNF (a) Ordering code	Pressure rating bar/psi	Orifice mm	c mm	d mm
	1/4" BSP	F3-AFG-42	FU3-AFG-42	4200 / 60,000	5	HEX.36	56
	1/2" BSP	F3-CFG-42	FU3-CFG-42	4200 / 60,000	5	HEX.36	56

All adapters can be delivered as bulkhead adapters. In this case a 'B' has to be added to the ordering code. For example: **F3-BMS-10-B**. For dimensions please consult Resato.







# HIGH PRESSURE TUBING



The resato product range includes cold drawn stainless steel tubing correlated to match the excellent performance standards of resato high pressure valves and fittings

Our high pressure tubing is manufactured specially for high pressure applications requiring both strength and corrosion resistance



## HIGH PRESSURE TUBING

Special features of Resato tubing are:

- high yield strength
- good fatigue properties
- high quality surface finish of the internal tubing to ensure good flow and pressure characteristics.

## INSPECTION AND TESTING

The high pressure tubing is subjected to stringent inspection and testing procedures to ensure high quality and close dimensional tolerances. Hydrostatic testing is performed on selected samples. On request Resato will perform 100% hydrostatic testing.

## MILLIMETER O.D. TUBING

Tubing type	Working pressure bar / psi	Tubing size mm mm O.D. I.D.	Material Stainless steel type
T1-60/22-42 T1-60/22-70	4200 / 60,000 7000 / 100,000	6 2.2 6 2.2	1.4401 HP160*
T2-100/50-21 T2-100/36-42	2100 / 30,000 4200 / 60,000	10 5 10 3.6	1.4401 1.4401
T3-140/80-21 T3-140/50-42	2100 / 30,000 4200 / 60,000	14 8 14 5	1.4401 1.4401

\* In accordance with ASTM F 1586-95.

Please contact Resato for further specifications.

## MATERIALS

The standard material for Resato high pressure tubing is stainless steel DIN 1.4401 and HP160 (in accordance with ASTM F 1586-95). Tubing is available in random lengths of 4 to 6 metres.

## HEAVY-DUTY CYCLING SERVICE

Other material types are available on request. For heavy-duty cycling service Resato can supply auto frettaged tubing.

Tubing type	Working pressure bar / psi	Tubing size inch mm O.D. I.D.	Material Stainless steel type
T1-64/24-42 T1-64/16-100 T1-64/10-140	4200 / 60,000 10,000 / 150,000 14,000 / 200,000	1/4 2.4 1/4 1.6 1/4 1	1.4401 HP160* HP160*
T2-95/32-42 T2-95/32-70 T2-95/16-120	4200 / 60,000 7000 / 100,000 12,000 / 170,000	3/8 3.2 3/8 3.2 3/8 1.6	1.4401 HP160* HP160*
T3-143/80-21 T3-143/50-42 T3-143/80-42	2100 / 30,000 4200 / 60,000 4200 / 60,000	9/16 8 9/16 5 9/16 8	1.4401 1.4401 HP160*

### Bending radius

To maintain material specification integrity it is recommended that the MINIMUM-bending radius is at least 5 times the outer diameter of the tubing

### Ready-made nipples.

For rapid system setup tubing can be delivered complete with nipple ends (i.e. pre-cut, coned and threaded to size and length).

### How to order tubing

State length and tubing type code.

Example: 6 metres - T1-64/24-42

### How to order ready-made nipples

Add length in mm of the tube to the tubing type code.

Example: T1-60/22-42/200. This means tubing type coned, threaded with metric thread M6x1 and 200 mm in length.



**NOTES**

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## EXAMPLES OF RESATO HIGH-PRESSURE COMPONENTS

Fittings

General-purpose valves

Check valves

Swivels

Hoses

Piping

Pressure transducers

Rupture-disc safety devices

Quick connectors

## EXAMPLES OF RESATO HIGH-PRESSURE EQUIPMENT AND SYSTEMS

Air-driven pumps and gas boosters

Hydraulically-driven pumps and gas boosters

Autofrettage systems

Hose and cycle test units

Portable pressure-test equipment

Autoclaves

High pressure units for food preservation

Wellhead control units

Bolt tensioning equipment

Water-jet cutting systems

Computer-controlled high-pressure test equipment

## COMPANY PROFILE

Resato International B.V. is one of the leading manufacturers in the field of high pressure technology, developing high pressure components and systems up to 14,000 bar. As a result of nearly 20 years of experience, Resato has grown to become an intelligence center for the development, production and application of high-pressure systems. This forms an open source of information that is always at the disposal of our customers. Resato products are distributed worldwide via expertly trained agents. In house engineering and manufacturing are the basis for a unique formula that guarantees the quality of all Resato products. Our premises in Roden, The Netherlands, provide an ideal environment from which Resato continues to respond to the demands of a constantly evolving market.

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Internet: [www.resato.com](http://www.resato.com)

Please note that general data and specifications given in this brochure are subject to change without notice.  
Feel free to contact our sales department if you need more definite information.