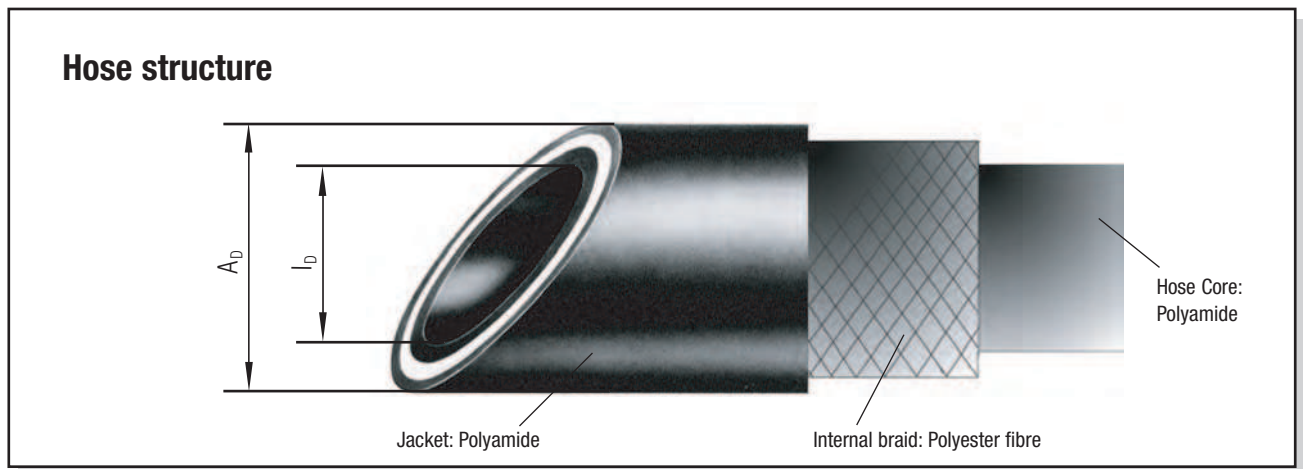


# MINIMESS®-Technical data on DN2 and DN4 microbore hose

## DN 2 and DN 4



Nominal width	Design	Application	$p_n$ in MPa	$p_B$ in MPa	$I_D$ in mm	$A_D$ in mm	$r_{min}$	Operable temperature range	Pressure utilisation factor	
DN 2	Standard 400	Perforated hose	40,0	104,0	2	5	20 mm (below -20 °C 30 mm)	-20 °C up to +100 °C short time up to +120 °C	0 °C 122% 30 °C 110%	
DN 2	Standard 630		63,0	195,0	2	5			50 °C 100% 80 °C 86%	
DN 2	Low temperature		63,0	150,0	2	5		-54 °C up to +100 °C	100 °C 77% 120 °C 68%	
DN 4	Standard 315		31,5	81,0	4	8	40 mm (below -20 °C 60 mm)	-20 °C up to +100 °C short time up to +120 °C	Example for calculation: MINIMESS®-hose DN 2/63 MPa at 30 °C pressure utilisation facto: 63,0 x 1,10 = 69,3 MPa	
DN 4	Standard 450		45,0	150,0	4	8				

Reference of the specified data: 20 °C – 3 K

$p_n$  = operating pressure

$p_B$  = bursting pressure

$I_D$  = internal diameter

$A_D$  = external diameter

$r_{min}$  = Minimum bend radius of hose

Perforated hose = Jacket of hose is perforated for applications using gas

## Definition for the tightness of a MINIMESS®-hose pipe

“Technically tight” describes systems, part systems and functional elements if the leakage rate amounts to  $< 0,00001 \text{ mbar l s}^{-1}$ .

## Criteria for selection of hoses and fittings

### 1. Selection of the hose assembly for the maximum operating pressure ( $p_n$ ):

When ordering a hose assembly, you have to pay attention to the operating pressures of the hose material and of the connection fitting. The lowest pressure determines the max. operating pressure of the complete hose assembly.

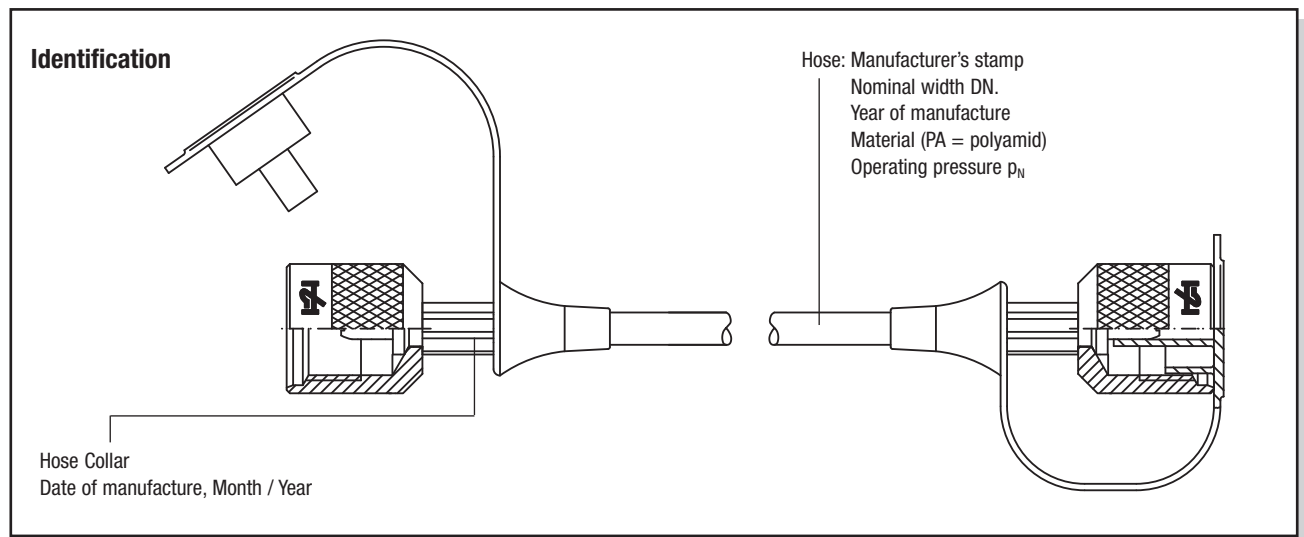
### 2. Selection of hose assembly for use with different media:

Hose assemblies can be used with different media, as long as the end connections are suitable. To check the compatibility for different media, please refer to our list on page 37.

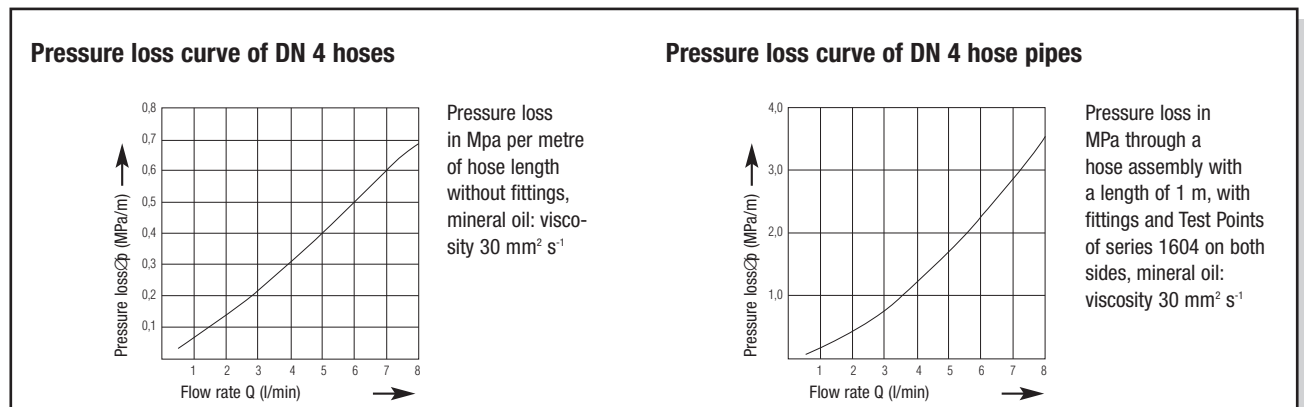
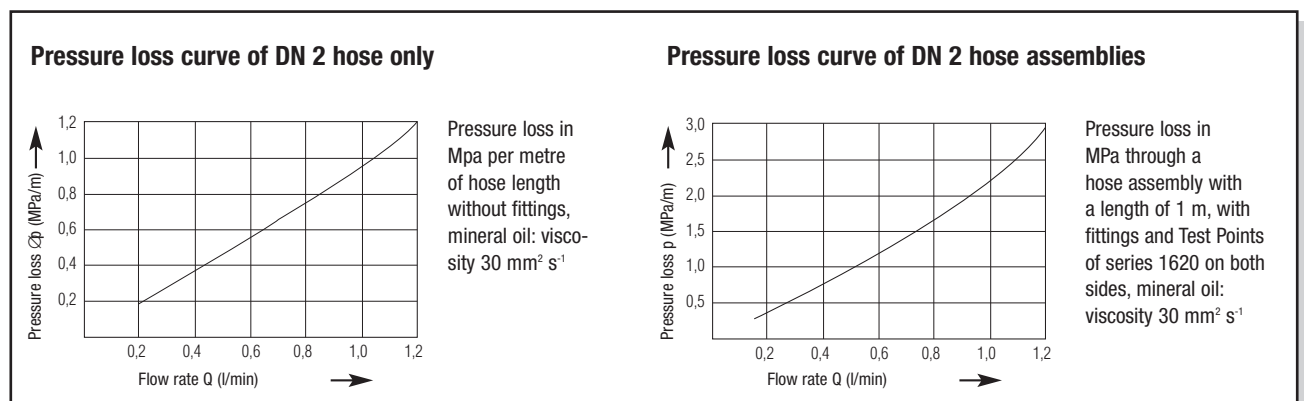
If your medium is not mentioned on page 37, please contact us!

## Fittings available with the following materials:

Free cutting steel 1.0718 galvanized and chromated, acid-resistant stainless steel 1.4571 (antimagnetic)



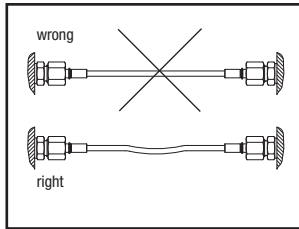
**Safety note:** The hose assemblies have to be protected from flames and sharp-edged, hot objects.



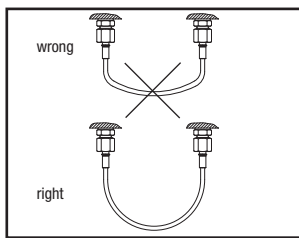
We guarantee a very high quality level of our MINIMESS®-systems, as all components are manufactured very precisely and to tight tolerances. All parts in our MINIMESS®-system are easy and safe to use. We reserve the right to carry out technical modifications!

# Mounting suggestions of MINIMESS®-hose assemblies

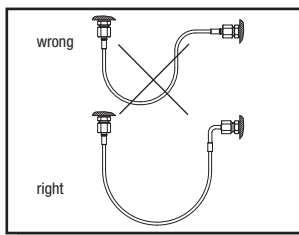
**Working reliability of a system and lifetime of the hose assembly are dependent on the correct installation. For this, here are some important notes:**



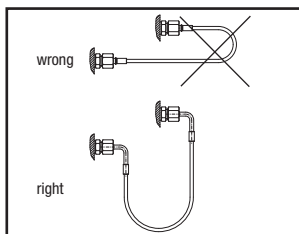
Under load, the length of a hose pipe can change. A shortening causes an additional tensile stress of the hose and the connections. Therefore, the hose pipe needs “slack” in an unpressurised state. Please tighten the union nuts only so far using recommended tightening torques. Further tightening does not improve the operation, but can damage the connections.



With curved assemblies, attention has to be paid to the bending radius. Sharp bends have to be avoided wherever possible. When calculating the length of a hose assembly, you have to pay attention to the fact that the connection fittings are not flexible. The correct calculation of the free hose length between the fittings is therefore essential.



90° hose fittings are also available to aid in the fitting of hose assemblies to maximize life and operation of the assembly.



90° hose fittings can also aid in the fitting of a tidy hose assembly in the tightest of porting requirements.

## Notes for operation and installation

In order to guarantee the operability of hoses and to not reduce assembly life by introducing additional strains, the following points have to be taken into consideration:

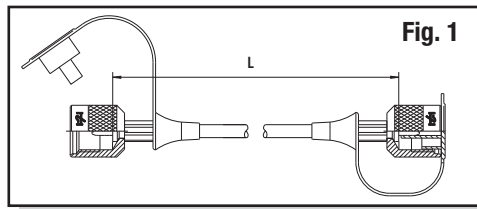
- Hose assemblies may not be strained during operation by external influences like tension, torsion and upset.
- The smallest mentioned bending radius of the hose must not be exceeded at any time.
- Hose assemblies have to be protected against external damages caused by thermal, chemical or mechanical influences.
- Painting or marking of hose assemblies should be avoided.

## Notes for storage of hose and hose assemblies

- Store in cool, dry places and avoid direct UV-irradiation.
- Sources of radiant heat should be avoided.
- Ozone building light fittings and electronic instruments with sparking should be kept away from hoses and hose material (e.g. mercury vapor discharge lamps)
- Optimum storage conditions are temperatures between +15°C and +25°C, a relative air humidity of 65%, as well as shielding against UV-radiation by special UV-impervious foils.
- The storage time should not exceed four years for hose and two years for hose assemblies.

# MINIMESS®-DN 2 microbore hose assemblies

For 1620, 1615, 1215 and plug-in series



The tables show the series 1620

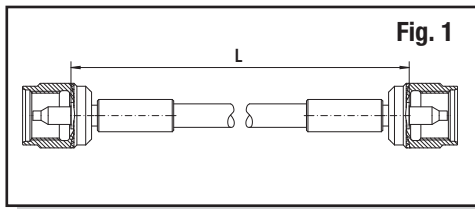
- Suitable for hydraulic and other oils on mineral oil basis
- Same fittings on both sides
- Fittings made of free cutting steel 1.0718

L	p max	Part-number	p max	Part-number
200	40 MPa	S 100-AC-AC-0020	63 MPa	S 110-AC-AC-0020
300		S 100-AC-AC-0030		S 110-AC-AC-0030
400		S 100-AC-AC-0040		S 110-AC-AC-0040
500		S 100-AC-AC-0050		S 110-AC-AC-0050
630		S 100-AC-AC-0063		S 110-AC-AC-0063
800		S 100-AC-AC-0080		S 110-AC-AC-0080
1000		S 100-AC-AC-0100		S 110-AC-AC-0100
1250		S 100-AC-AC-0125		S 110-AC-AC-0125
1500		S 100-AC-AC-0150		S 110-AC-AC-0150
2000		S 100-AC-AC-0200		S 110-AC-AC-0200
2500		S 100-AC-AC-0250		S 110-AC-AC-0250
3200		S 100-AC-AC-0320		S 110-AC-AC-0320
4000		S 100-AC-AC-0400		S 110-AC-AC-0400
5000	S 100-AC-AC-0500	S 110-AC-AC-0500		

Fittings made of stainless steel 1.4571		Exchange number 1 to 7, when ordering	7	7
Series 1215 (picture 1) (fixing thread)		When ordering, replace the letter codes with -AA-AA-.	-AA-AA-	
Series 1615 (picture 1) (M 16 x 1,5)		When ordering, replace the letter codes with -AB-AB-.	-AB-AB-	
Plug-in series Max. pressure 40,0 MPa		When ordering, replace the letter codes with -AI-AI-.	-AI-AI-	
DN 2 measuring hoses with protection against leakage with integrated return valve				
Series 1620 (M 16x2)		When ordering, replace both letter codes with -AR-AR-.	-AR-AR-	


# MINIMESS®-DN 4 microbore hose assemblies 1604

## for series 1604



- Suitable for hydraulic and other oils on mineral oil basis
- Same fittings on both sides
- Fittings made of free cutting steel 1.0718

L	p max	Part-number	p max	Part-number
200	31,5 MPa	S 150-AD-AD-0020	45 MPa	S 160-AD-AD-0020
300		S 150-AD-AD-0030		S 160-AD-AD-0030
400		S 150-AD-AD-0040		S 160-AD-AD-0040
500		S 150-AD-AD-0050		S 160-AD-AD-0050
630		S 150-AD-AD-0063		S 160-AD-AD-0063
800		S 150-AD-AD-0080		S 160-AD-AD-0080
1000		S 150-AD-AD-0100		S 160-AD-AD-0100
1250		S 150-AD-AD-0125		S 160-AD-AD-0125
1500		S 150-AD-AD-0150		S 160-AD-AD-0150
2000		S 150-AD-AD-0200		S 160-AD-AD-0200
2500		S 150-AD-AD-0250		S 160-AD-AD-0250
3200		S 150-AD-AD-0320		S 160-AD-AD-0320
4000		S 150-AD-AD-0400		S 160-AD-AD-0400
5000		S 150-AD-AD-0500		S 160-AD-AD-0500

Armaturen aus stainless steel 1.4571  Exchange number 1 to 7, when ordering **7**




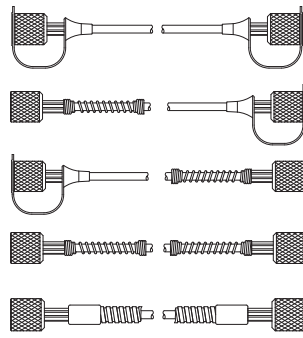
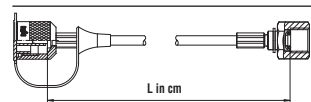
**7**

### DN 4 measuring hoses with protection against leakage with integrated return valve

Series 1604 (fixing thread 16)  When ordering, replace both letter codes with -AY-AY-.  -AY-AY- Lmin = 300 mm

Delivery effects with protective plugs on both sides.

# Order chart for hose material and accessories DN 2 and DN 4

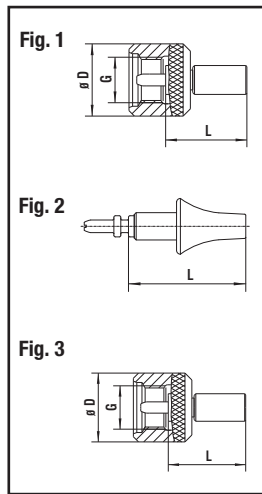
Options		Part-number S XXX - XX - XX - XXXX			
<b>Material of the fittings</b>					
Free cutting steel 1.0718 galvanized and chromated		1			
Free cutting steel 1.0718 plus sealing for brake fluid		2			
Acid-resistant stainless steel 1.4571 		7			
<b>Hose material DN 2</b>					
Perforated standard hose	40,0 MPa		0		
Perforated standard hose	63,0 MPa		1		
Perforated low temperature hose	63,0 MPa		2		
<b>Hose material DN 4</b>					
Perforated standard hose	31,5 MPa		5		
Perforated standard hose	45,0 MPa		6		
<b>Standard</b>					
<b>Additional options</b>					
Anti buckling spiral, left side (min. hose length 40 cm)			1		
Anti-buckling spiral, right side (min. hose length 40 cm)			2		
Anti-buckling spiral both sides (min. hose length 40 cm)			3		
Aluminium protection hose (min. hose length 40 cm)			4		
<b>Freely selectable fitting</b> Input as a 2-digit fitting code from page 27 on					
<b>Freely selectable fitting</b> Input as a 2-digit fitting code from page 27 on					
<b>Length L in cm</b> (e.g. 30 cm = 0030 or 500 cm = 0500) Input as a 4-digit group of figures					

Attention: Aluminium protection in combination with an anti-buckling spiral is not possible.

# Selectable hose ends for DN 2 and DN 4 hose

Free cutting steel 1.0718 galvanized and chromated

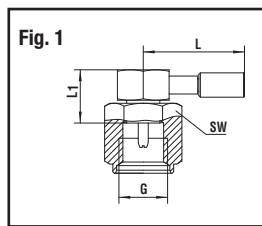
## MINIMESS®-connection



Fittings	Part-number	Fig.	Thread G	p max in MPa	ø D in mm	L	Fitting code
DN 2	2119-02-00.00	1	1215	63	20	22	AA
	2119-03-00.00	1	1615	63	20	20	AB
	2119-04-00.00	1	1620	63	20	20	AC
	2119-21-00.00	2	Plug-in	40	–	30,5	AI

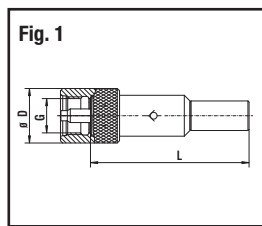
DN 4	2119-05-00.00	3	1215	63	20	35	AA
	2119-06-00.00	3	1615	63	20	35	AB
	2119-07-00.00	3	1620	63	20	35	AC
	2119-14-00.00	3	1604	40	22	35	AD

## MINIMESS®-connection 90°



Fittings	Part-number	Fig.	Thread G	p max in MPa	SW	L	L <sub>1</sub>	Fitting code
DN 2	2119-02-01.00	1	1215	63	22	35,5	17,5	AJ
	2119-03-01.00		1615	63	22	35,5	17,5	AK
	2119-04-01.00		1620	63	22	35,5	17,5	AL

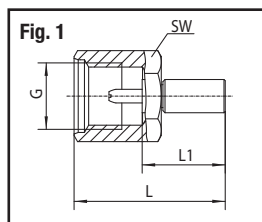
## MINIMESS®-connection with non-return valve



Fittings	Part-number	Fig.	Thread G	p max in MPa	ø D in mm	L	Fitting code
DN 2	2119-04-04.00	1	1620	63	20	50	AR

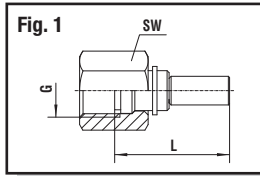
DN 4	2119-09-04.00	1	1604	40	24	70	AY
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## MINIMESS®-connection with hexagon clamping nut



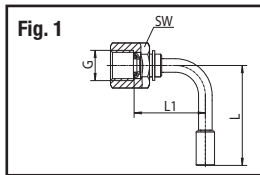
Fittings	Part-number	Fig.	Thread G	p max in MPa	SW	L	L <sub>1</sub>	Fitting code
DN 2	2119-02-03.00	1	1215	63	19	38	22	AM
	2119-03-03.00		1615	63	19	38	20	AN
	2119-04-03.00		1620	63	19	38	20	AO

## Pressure gauge connection according to DIN 16 288 with O-ring sealing



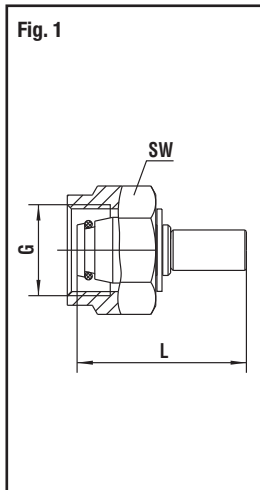
Fittings	Part-number	Fig.	Thread G	p max in MPa	SW in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-20-21.00	1	ISO 228-G 1/4	63	17	28,5	–	FG
	5140-20-22.00		ISO 228-G 1/2	63	27	31,5	–	FH

## Pressure gauge connection according to DIN 16 288 - 90° with O-ring sealing



Fittings	Part-number	Fig.	Thread G	p max in MPa	SW in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-20-23.00	1	ISO 228-G 1/4	63	17	43,5	32	FI
	5140-20-24.00		ISO 228-G 1/2	63	27	43	43	FJ

## DKO - connection “light (L) and heavy (S) series” for solder free screw-in pipe connections according to DIN 2353 (24°)



Fittings	Part-number	Fig.	Series	Thread G	p max in MPa	SW in mm	L	Fitting code
DN 2	5140-06-03.00	1	L 6	M 12 x 1,5	31,5	14	30	CQ
	5140-06-04.00		L 8	M 14 x 1,5	31,5	17	34	CR
	5140-06-07.00		L 10	M 16 x 1,5	31,5	19	33,5	CS
	5140-06-08.00		L 12	M 18 x 1,5	31,5	22	33,5	CT

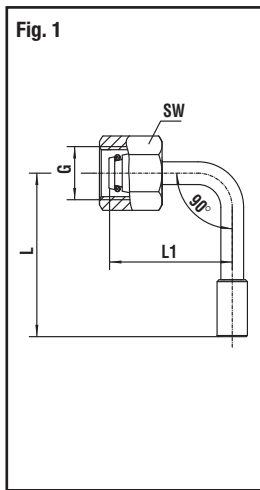
DN 2	5140-06-01.00	1	S 6	M 14 x 1,5	63	17	30	CU
	5140-06-02.00		S 8	M 16 x 1,5	63	19	34	CV
	5140-06-05.00		S 10	M 18 x 1,5	63	22	33,5	CW
	5140-06-06.00		S 12	M 20 x 1,5	63	24	23,5	CX

DN 4	5140-16-03.00	1	L 6	M 12 x 1,5	31,5	14	40	CQ
	5140-16-04.00		L 8	M 14 x 1,5	31,5	17	41	CR
	5140-16-07.00		L 10	M 16 x 1,5	31,5	19	44,5	CS
	5140-16-08.00		L 12	M 18 x 1,5	31,5	22	44,5	CT

DN 4	5140-16-01.00	1	S 6	M 14 x 1,5	63	17	40	CU
	5140-16-02.00		S 8	M 16 x 1,5	63	19	41	CV
	5140-16-05.00		S 10	M 18 x 1,5	63	22	44,5	CW
	5140-16-06.00		S 12	M 20 x 1,5	63	24	44,5	CX

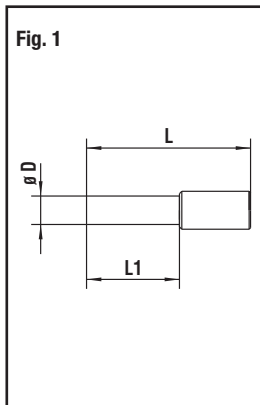


## DKO - connection “light (L) and heavy (S) series” 90° for solder free screw-in pipe connections according to DIN 2353 (24°)



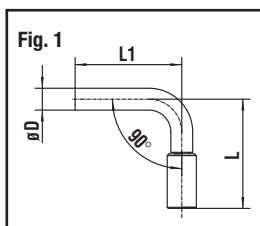
Fittings	Part-number	Fig.	Series	Thread G	p max in MPa	SW in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-06-13.00	1	L 6	M 12 x 1,5	31,5	14	30	32,5	DA
	5140-06-18.00		L 8	M 14 x 1,5	31,5	17	34	32,5	DB
	5140-06-10.00		L 10	M 16 x 1,5	31,5	19	33,5	37,5	DC
	5140-06-17.00		L 12	M 18 x 1,5	31,5	22	33,5	37,5	DD
DN 2	5140-06-15.00	1	S 6	M 14 x 1,5	63	17	30	32,5	DE
	5140-06-19.00		S 8	M 16 x 1,5	63	19	34	32,5	DF
	5140-06-14.00		S 10	M 18 x 1,5	63	22	33,5	37,5	DG
	5140-06-16.00		S 12	M 20 x 1,5	63	24	23,5	37,5	DH

## Standpipes for solder free screw-in pipe connection according to DIN 2353



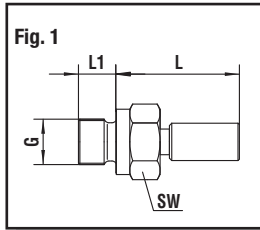
Fittings	Part-number	Fig.	Execution	p max in MPa	ø D in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-08-16.00	1	straight	10	4	35	20	BA
	5140-08-01.00			63	6	35	20	BB
	5140-08-11.00			63	8	35	21	BC
	5140-07-01.00			63	6,35	35	20	BD
DN 4	5140-18-01.00	1	straight	63	6	48	20	BB
	5140-18-02.00			45	8	47	21	BC

## Standpipes, 90°, for solder free screw-in pipe connection acc. to DIN 2353



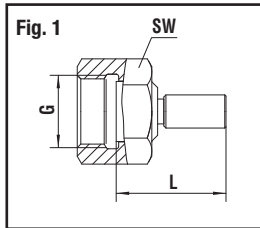
Fittings	Part-number	Fig.	Execution	p max in MPa	ø D in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-08-02.00	1	90°	63	6	30	28	BG
DN 4	5140-08-12.00	1	90°	63	6	48	25	BG

## Male threaded connection



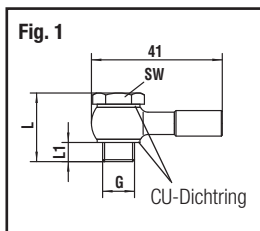
Fittings	Part-number	Fig.	Thread G	p max in MPa	SW in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-24-03.00	1	ISO 228-G 1/8	40	14	26,5	8	GA

## ORS-connection



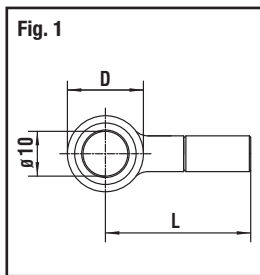
Fittings	Part-number	Fig.	Thread G	p max in MPa	SW in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-26-03.00	1	11/16-16UN	40	22	26,5	-	HC

## Banjo fitting with M10x1 Banjo Bolt



Fittings	Part-number	Fig.	Thread G	p max in MPa	SW in mm	L	L <sub>1</sub>	Fitting code
DN 2	5140-27-01.00	1	M 10 x 1	20	14	28	10	IA

## Banjo fitting to accept M10x1 Banjo Bolt according to DIN 7642

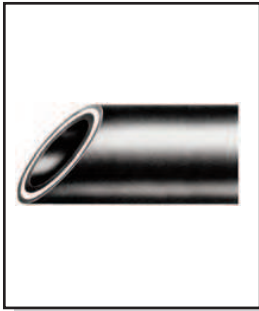


Fittings	Part-number	Fig.		p max in MPa	SW in mm	L	D	Fitting code
DN 2	5140-27-02.00	1	-	20	-	41	17	IB
DN 4	5140-27-11.00	1	-	20	-	43,5	17	IB

# MINIMESS®-hoses

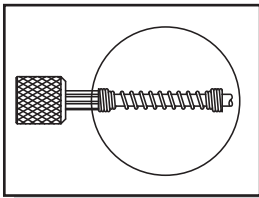
## Accessories

### Hose material DN 2 and DN 4



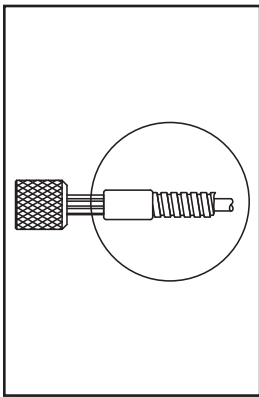
Hose material for self assembly		Part-number
Perforated hose, <b>DN 2</b>	40,0 MPa	2020-01-00.31
Perforated hose, <b>DN 2</b>	63,0 MPa	2020-01-00.30
Low temperature, Perforated hose, <b>DN 2</b>	63,0 MPa	2020-01-00.18
Perforated hose, <b>DN 4</b>		31,5 MPa
Perforated hose, <b>DN 4</b>		45,0 MPa
		2030-01-00.22
		2030-01-00.24

### Anti-buckling spiral



Anti-buckling spiral for self assembly		Part-number
Anti-buckling spiral for <b>DN 2</b>		2123-01-00.01
Anti-buckling spiral for <b>DN 4</b>		2133-01-00.01

### Aluminium protection hose



Aluminium protection hose for self assembly		Part-number
Aluminium protection hose <b>DN 2</b> In addition to this, 2 pieces end screw sockets are necessary		2121-01-00.01
End screw sockets <b>DN 2</b>		2121-01-00.02
Aluminium protection hose for self assembly		Part-number
Aluminium protection hose <b>DN 4</b> In addition to this, 2 pieces end screw sockets are necessary		2131-01-00.01
End screw sockets <b>DN 4</b>		2131-01-00.02