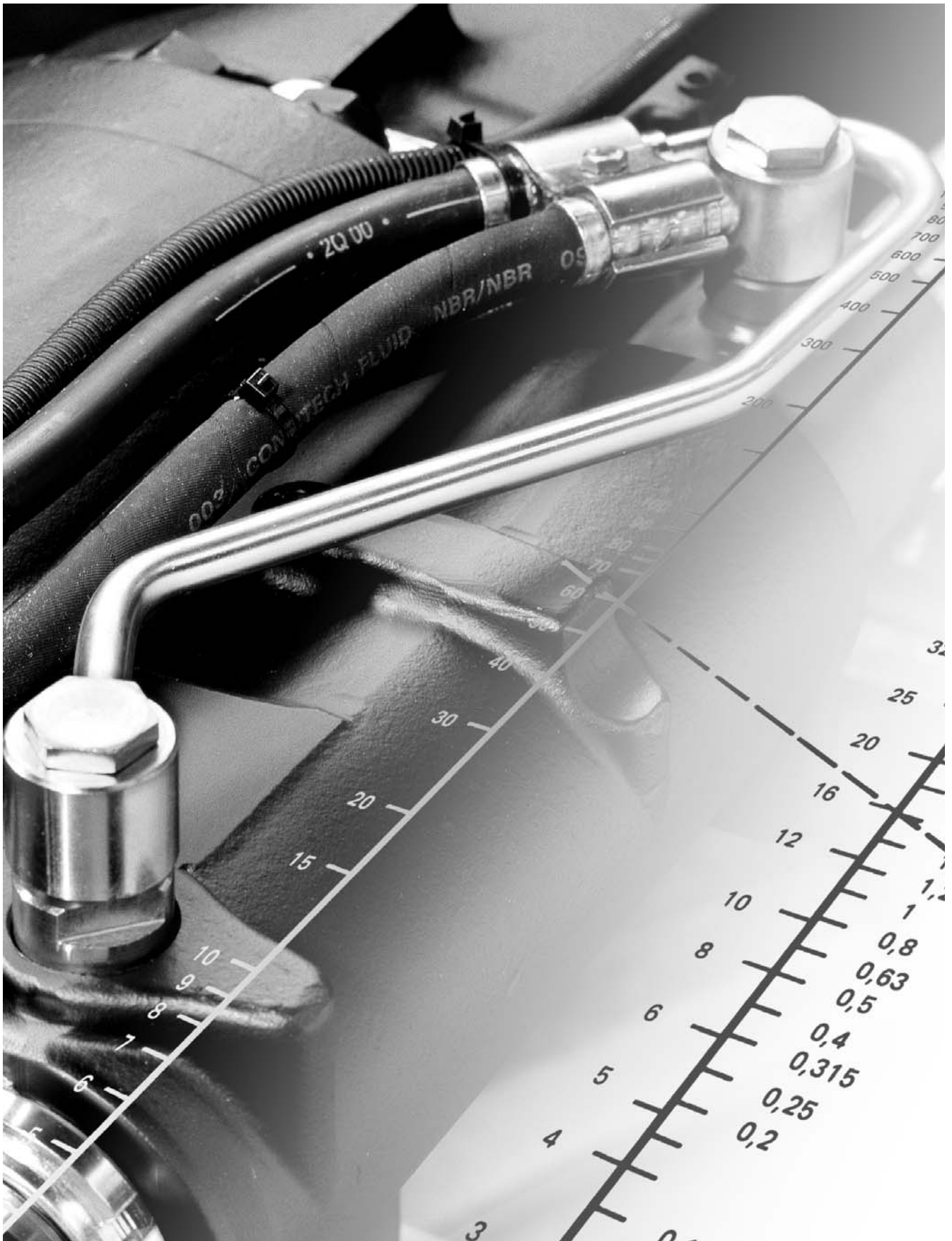


# Technical information



## 1.1 Hose assemblies as elements in hydraulic systems

### Hose assemblies

Hose assemblies have to perform crucial functions. Apart from transmitting power by means of liquid (hydraulic oil) they are frequently subjected to unwanted movements.

When selecting a hose assembly the starting point is the highest pressure it will have to withstand.

Although hydraulic systems are very likely to experience pressure surges – caused for example merely by a gear change – the pressure is often assumed to be no greater than that permitted after regulating the built-in pressure limiting value. In assuming this, it is often neglected that the response time of such components is relatively long compared with peak pressures that occur momentarily and often with greater frequency and whose multiplicity of causes, it may be assumed, are known. In cases of doubt, an oscillographical measurement is to be recommended that shows the frequency and amplitude of the actual pressure changes. Users/planners should in any case systematically investigate the specific application in advance and then select, install and maintain the hose type that will unconditionally meet the in-service requirements.

The following 15 pages provide technical information such as determining the nominal diameter for a given throughput, dimensions of the hose and of the hose attachments, carrying capacity, chemical and thermal resistance, guidelines on the proper installation of hose assemblies and on determining the nominal length. All these items are crucial when selecting and installing a hose assembly.

The following notes are guidelines, and no claim is made to completeness. We recommend the drawing up of performance specifications when the demands made on hose assemblies go beyond those described in pertinent recommendations. Hose assemblies, as referred to in safety regulations, are hoses that are connected with hose fittings, thereby forming a functioning unit.

Hose assemblies must be put together in compliance with the ContiTech Techno-Chemie hose assembly manual. In particular, the following minimum requirements must be met:

1. Hose and couplings must be compatible and must function properly.
2. The max. shelf life for hoses and hose assemblies may not be exceeded.  
Regarding storage time, useful life and reuse of hose assemblies, please refer to DIN 7716 and 20066 Part 5.
3. In-service hose assemblies may not have any defects.

NOTE: Incorrect selection, installation, use and maintenance may lead to a shorter useful life, bodily injury and/or property damage.

When the right hose material is to be selected, ContiTech Techno-Chemie is pleased to assist and in complicated cases to work out an optimum solution, so that the above points can be avoided.

### Marking of hydraulic hose assemblies

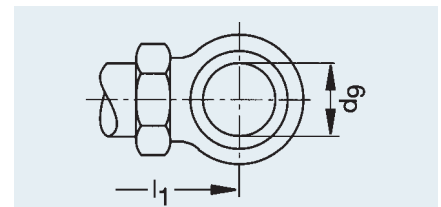
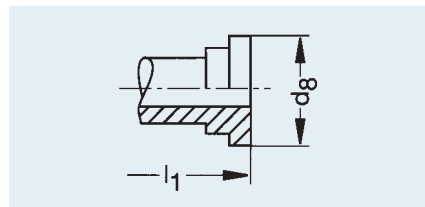
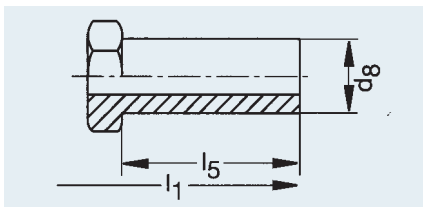
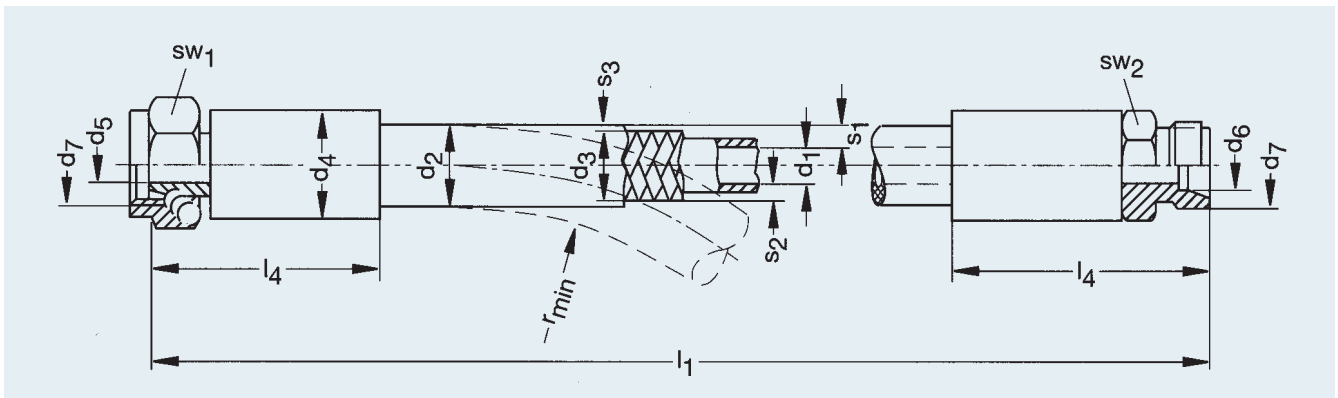
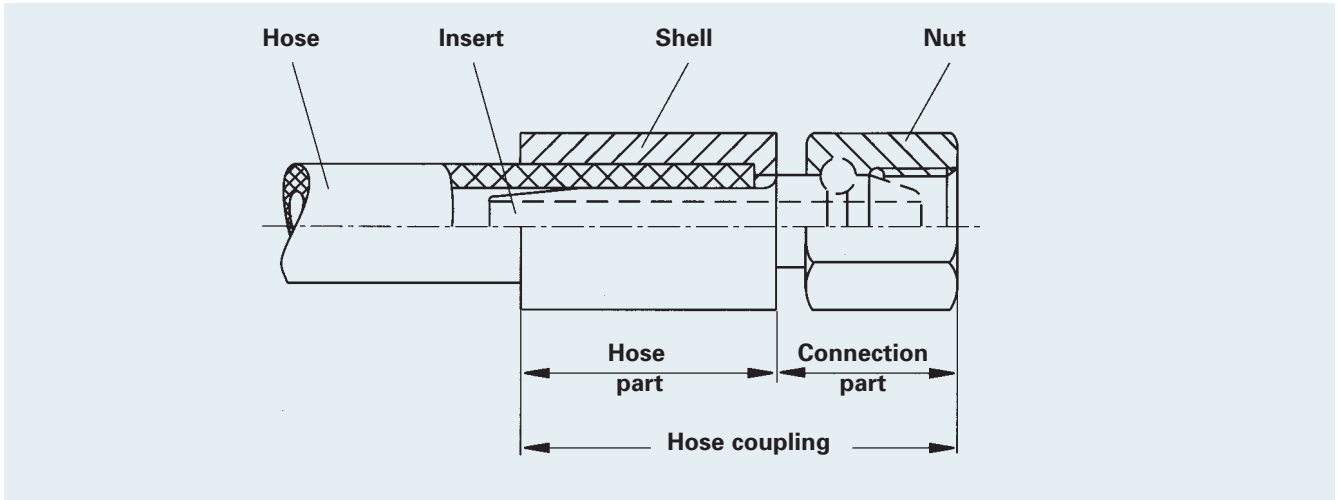
In accordance with DIN safety regulations, hydraulic hose assemblies must be marked clearly and permanently with the following data:

1. The manufacturer of the hose assembly
2. The date (i.e. month and year) of manufacture
3. The max. permissible dynamic working pressure (or another detail, such as the test pressure, as agreed with the customer).

Example: TCH 05/91 PN 250 (test pressure 600 bar)

## 1.2 Elements of a hose assembly and definitions

### Letters used for measurements



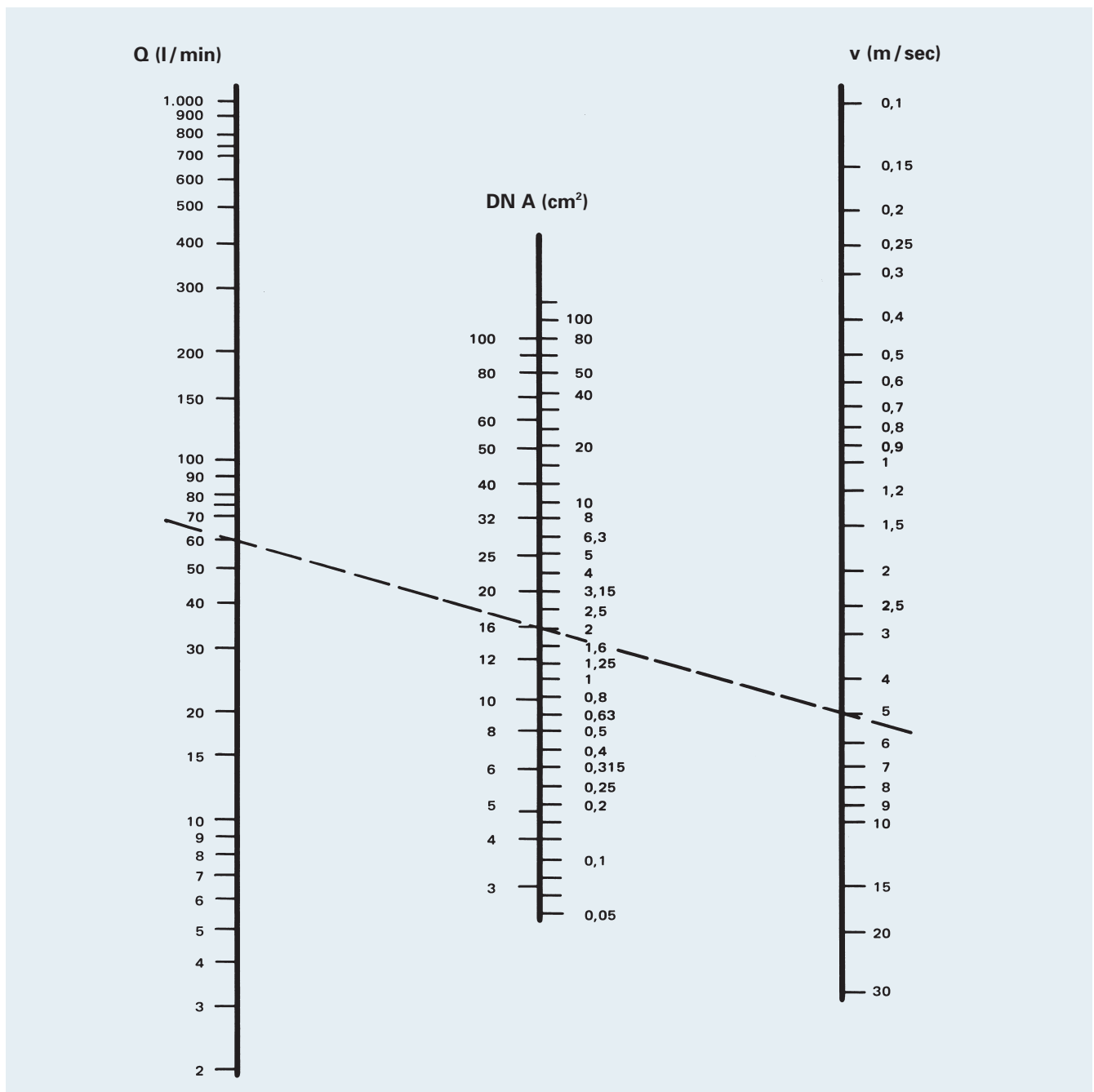
- $d_1$  = Inner diameter of hose
- $d_2$  = Outer diameter of hose
- $d_3$  = Diameter of outer ply
- $d_4$  = Largest outer diameter of shell
- $d_5$  = Smallest inner diameter of insert
- $d_6$  = Inner diameter of coupling for tube connection
- $d_7$  = Diameter of connecting thread
- $d_8$  = Outer diameter of flanged head
- $d_9$  = Inner diameter of cross bore of the banjo
- $l_1$  = Hose assembly length from sealing surface to sealing surface
- $l_4$  = Fitting length to sealing surface
- $l_5$  = Exposed pipe length
- $r_{min}$  = smallest permissible bending radius on the inside
- $s_1$  = Hose wall thickness between inner and outer diameter
- $s_2$  = Hose wall thickness between inner diameter and diameter of outer ply
- $s_3$  = Hose wall thickness of the hose outer cover
- $sw_1$  = Width across flats of nut
- $sw_2$  = Width across flats of hexagonal bolt for securing

### Nominal diameter DN

The nominal diameter is a parameter used in hose assembly systems as a way of identifying matching parts, e.g. hoses and fittings.

The nominal diameters are approximately equal to the inner diameters  $d_1$  of the hoses, whereas the couplings for design reasons have smaller inner diameters. The nominal diameter has no unit and may not be used as a measurement, as defined in DIN 406. The following nomogram assists in determining the nominal diameter.

### Nomogram to determine the nominal diameter DN as a function of the volume flow and the flow rate



Application: The joining line between the two values Q (l/min) and v (m/sec) on the outer scales gives the nominal diameter at the point where it intersects the middle line.

The resistance to flow has been neglected.

Example:

Given volume flow	Q = 60 l/min
Selected flow speed	v = 5 m/sec
Nominal diameter as determined	= 16

**Cross-reference of thread to nominal diameters DN**

DN mm	Pipe diameter		Size	Pipe-diameter inch	Metric ISO thread			Thread acc. to ISO 228-1		
	LL+L series mm	S series mm			LL ** series	L series	S series	LL series	L series	S series
2	4				M8x1			G 1/8 A*		
4	5	6	-2		M10x1		M14x1,5	G 1/8 A*		G 1/4 A*
5	6	8	-3	3/16"	M12x1,5 (M10x1)	M12x1,5	M16x1,5	G 1/8 A*	G 1/8 A*	G 1/4 A*
6	8	10	-4	1/4"	M14x1,5 (M12x1)	M14x1,5	M18x1,5	G 1/8 A*	G 1/4 A*	G 3/8 A*
8	10	12	-5	5/16"	M16x1,5	M16x1,5	M20x1,5	G 1/4 A*	G 1/4 A*	G 3/8 A*
10	12	14	-6	3/8"	M18x1,5	M18x1,5	M22x1,5	G 1/4 A*	G 3/8 A*	G 1/2 A*
12	15	16	-8	1/2"	M22x1,5	M22x1,5	M24x1,5		G 1/2 A*	G 1/2 A*
16	18	20	-10	5/8"	M26x1,5	M26x1,5	M30x2		G 1/2 A*	G 3/4 A*
20	22	25	-12	3/4"	M30x1,5	M30x2	M36x2		G 3/4 A*	G 1 A*
25	28	30	-16	1"	M38x1,5	M36x2	M42x2		G 1 A*	G 1 1/4 A*
32	35	38	-20	1 1/4"	M45x1,5	M45x2	M52x2		G 1 1/4 A*	G 1 1/2 A*
40	42		-24	1 1/2"	M52x1,5	M52x2			G 1 1/2 A*	
50			-32	2"						

\* for internal thread "A" does not apply

\*\* The threads written in brackets apply to threaded pins acc. to DIN 3853

DN	Pipe-diameter		Size	Pipe-diameter inch	BSP (BSPT / BSPP)	NPTF/NPSM 30°	SAE J512 90° taper	JIC 74° / SAE O-R	ORFS acc. to SAE J 1453
	LL+L series mm	S series mm							
2	4								
4	5	6	-2	1/8"	1/8" - 28	1/8" - 27	5/16" - 24	5/16" - 24	
5	6	8	-3	3/16"	1/8" - 28		3/8" - 24	3/8" - 24	
6	8	10	-4	1/4"	1/4" - 19	1/4" - 18	7/16" - 20	7/16" - 20	9/16" - 18
8	10	12	-5	5/16"			1/2" - 20	1/2" - 20	
10	12	14	-6	3/8"	3/8" - 19	3/8" - 18	9/16" - 18	9/16" - 18	11/16" - 16
12	15	16	-8	1/2"	1/2" - 14	1/2" - 14	3/4" - 16	3/4" - 16	13/16" - 16
16	18	20	-10	5/8"	5/8" - 14		7/8" - 14	7/8" - 14	1" - 14
20	22	25	-12	3/4"	3/4" - 14	3/4" - 14	1 1/16" - 12	1 1/16" - 12	1" - 3/16" - 12
25	28	30	-16	1"	1" - 11	1" - 11 1/2	1 5/16" - 12	1 5/16" - 12	1 7/16" - 12
32	35	38	-20	1 1/4"	1 1/4" - 11	1 1/4" - 11 1/2	1 5/8" - 12	1 5/8" - 12	1 11/16" - 12
40	42		-24	1 1/2"	1 1/2" - 11	1 1/2" - 11 1/2	1 7/8" - 12	1 7/8" - 12	2" - 12
50			-32	2"	2" - 11	2" - 11 1/2	2 1/2" - 12	2 1/2" - 12	

**Recommended tightening torques for nuts of hose assemblies**

Series	Pipe-outer-diam.	DN	Thread	Torque Ma in mkp for TCH fitting			
				DKL 2)	DKS 2)	DKOL 3)	DKOS 3)
L	6	5	M12x1,5	1,0 - 1,2	–	0,8 - 1,0	–
	8	6	M14x1,5	1,2 - 1,5	–	1,0 - 1,3	–
	10	8	M16x1,5	2,0 - 2,5	–	1,8 - 2,3	–
	12	10	M18x1,5	3,0 - 3,5	–	2,7 - 3,2	–
	15	13	M22x1,5	5,0 - 5,5	–	4,5 - 5,0	–
	18	16	M26x1,5	7,5 - 8,5	–	7,0 - 8,0	–
	22	20	M30x2	11 - 12	–	10 - 11	–
	28	25	M36x2	16 - 18	–	15 - 16	–
	35	32	M45x2	24 - 26	–	20 - 22	–
	42	40	M52x2	32 - 35	–	30 - 32	–
S	8	5	M16x1,5	–	2,0 - 2,5	–	1,8 - 2,3
	10	6	M18x1,5	–	3,0 - 3,5	–	2,7 - 3,2
	12	8	M20x1,5	–	4,5 - 5,0	–	4 - 5
	14	10	M22x1,5	–	6 - 7	–	5 - 6
	16	13	M24x1,5	–	8 - 10	–	7 - 9
	20	16	M30x2	–	13 - 15	–	12 - 14
	25	20	M36x2	–	24 - 27	–	20 - 24
	30	25	M42x2	–	36 - 40	–	32 - 36
38	32	M52x2	–	60 - 64	–	52 - 56	

The adjacent values are reference values only and must be considered separately for each case; if necessary, the values must be checked.

- 2) DKL + DKS acc. to TCH 105 05
- 3) DKOL + DKOS acc. to TCH 105 06

Nuts acc. to DIN 3870 shape A

Counter-fitting:  
Threaded pins acc. to DIN 3853  
Bore type W DIN 3861 L+S series

### 1.3 General guidelines for the installation of hose assemblies

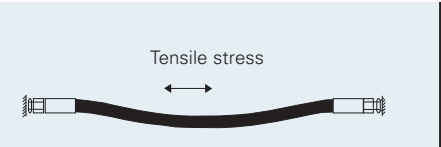
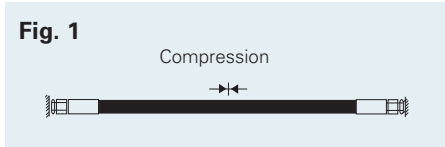
Certain regulations have to be complied with when installing hose assemblies to ensure and to maintain their functioning. Crucial elements are: ease of installation and removal, optimum installation routing and regular checking, so that any ensuing problems are minimised.

The following instructions are based on DIN 20066 Part 4.

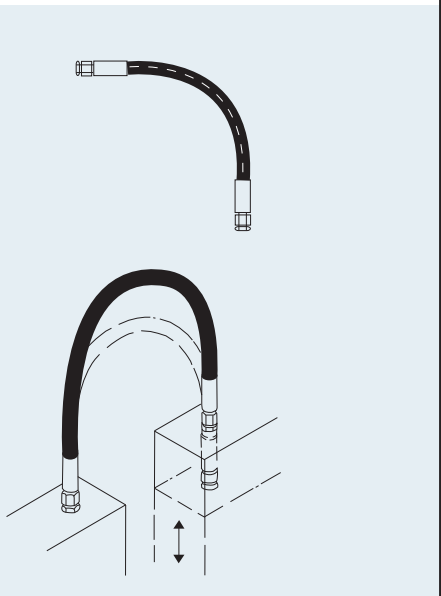
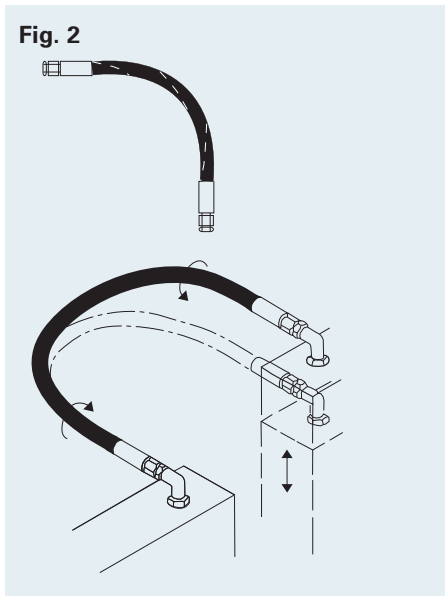
**Incorrect**

**Correct**

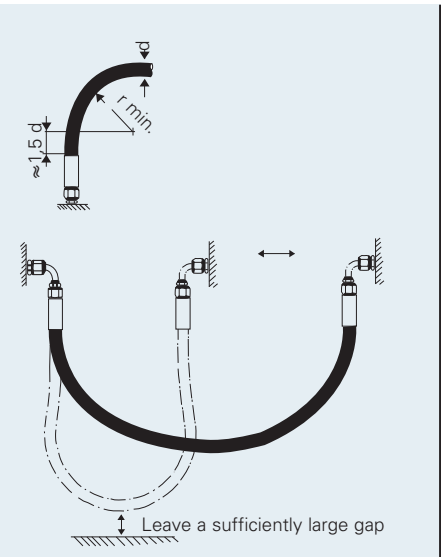
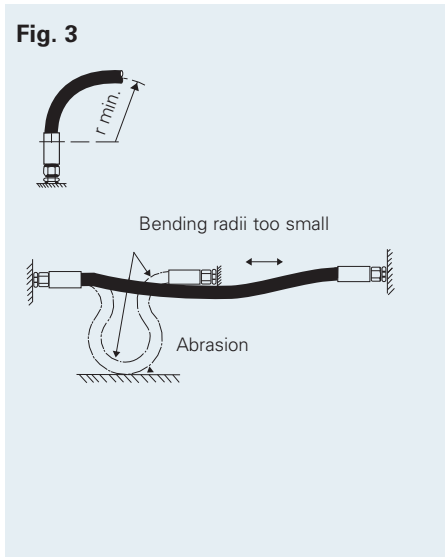
**Notes**



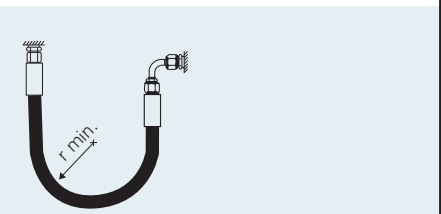
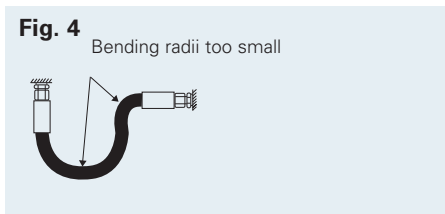
Hose assemblies are to be installed in a way that excludes both tensile stressing (except by own weight) and compression. So they should be mounted with a sag that can take up any shortening of the hose. (See also the section "Length changes and volume increases in hose assemblies").



Care must be taken not to twist the hose. Torsional stressing reduces the cross-section, thereby restricting the throughput and even damaging the plies (pressure bearers). The hose may not be twisted when the fittings are attached, either.



Hose assemblies may not be bent through an angle exceeding the permitted bending radius and certainly not buckled or kinked. This would cause a pressure build-up. Non-straight configurations are to be achieved by means of elbows and/or shaped hoses. The min. bending radii given in the manual refer to the rigid installation of hose assemblies. If the hose is required to move repeatedly in a tight bending radius (continuous operation), then the radius should be designed as large as possible. Any bending of a hose should not commence at a point less than 1.5 d from an end.

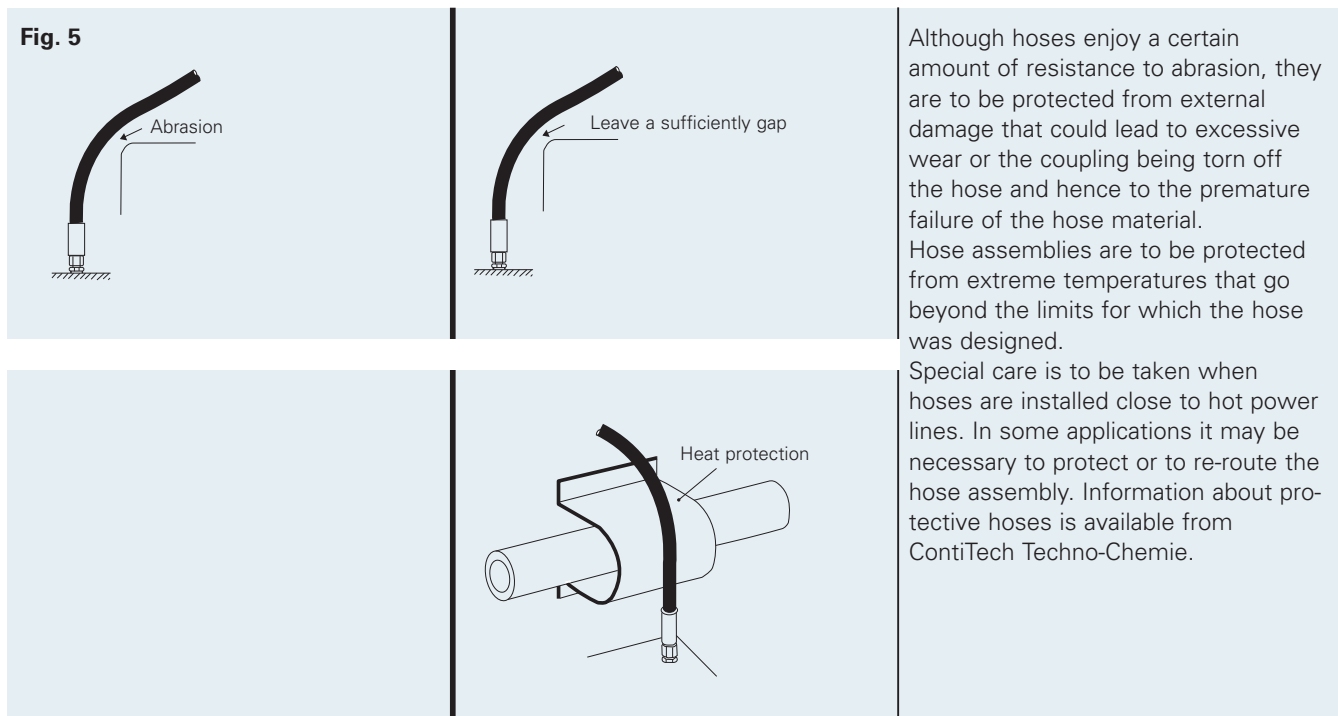


Any deviation from the bending radii stipulated in the standard may well shorten the service life, depending on the stressing involved.

**Incorrect**

**Correct**

**Notes**



Although hoses enjoy a certain amount of resistance to abrasion, they are to be protected from external damage that could lead to excessive wear or the coupling being torn off the hose and hence to the premature failure of the hose material. Hose assemblies are to be protected from extreme temperatures that go beyond the limits for which the hose was designed.

Special care is to be taken when hoses are installed close to hot power lines. In some applications it may be necessary to protect or to re-route the hose assembly. Information about protective hoses is available from ContiTech Techno-Chemie.

It is obviously not possible to illustrate all forms of correct and incorrect installation.

If very difficult installation conditions prevail, a consultation with ContiTech Techno-Chemie is recommended.

In the case of very unusual applications, it may be necessary to conduct trials before the hoses are selected.

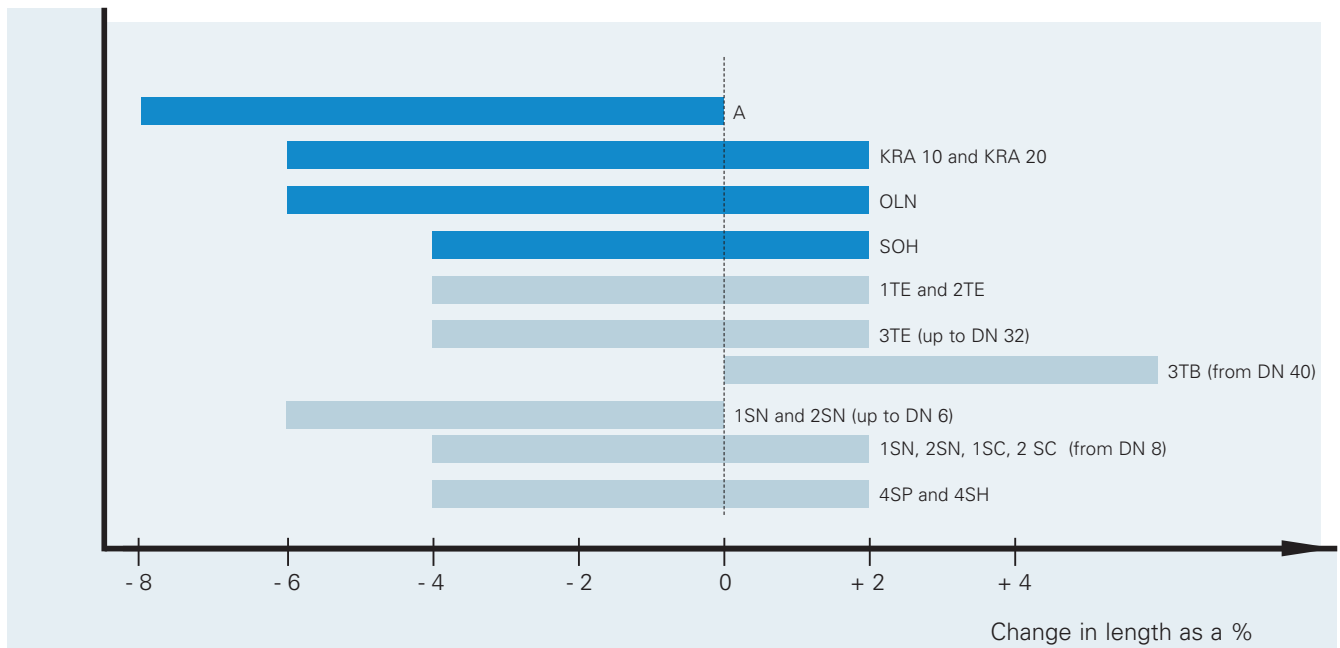
### 1.4 Length changes and volume increases in hose assemblies

The elasticity of hose material allows a hose to expand under pressure within certain limits.

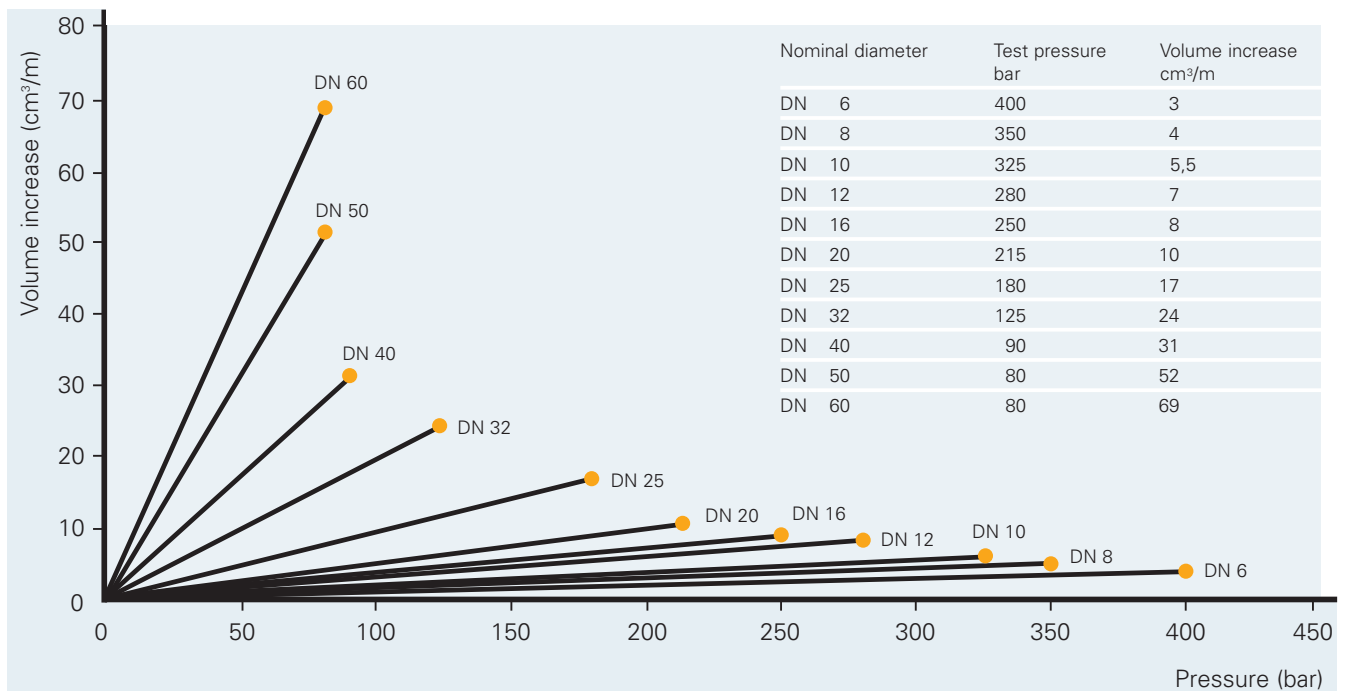
Under pressure, the yarn or steel-wire braid reinforcement – depending on the type and angle of twist – can withstand both longitudinal and radial expansion. The hose may experience a positive or negative change in length. The configuration in the installed state must allow for all possible changes in length so as to prevent the hose being ripped out of its coupling. The increase in volume that occurs helps to damp pressure peaks within certain limits.

Information on the various hose types is available on request.

#### Length changes under pressure for selected hose types in the most common nominal diameters



#### Volume increases of hose assemblies (example: hose type 2 SN)



## 1.5 Important standards

Account should be taken of relevant statutory industrial and manufacturing standards when hoses are selected.

### Hoses

Standard	Subject	Corresponds to*	Hose
DIN EN 853 (issued 02.97)	Hydraulic hoses with wire braid reinforcement	SAE 100 R1 AT SAE 100 R1 A SAE 100 R2 AT SAE 100 R2 A	1 SN 1 ST 2 SN 2 ST
DIN EN 854 (issued 02.97)	Hydraulic hoses with textile ply	SAE 100 R6 – SAE 100 R3	1 TE 2 TE 3 TE / 3TB
DIN EN 855 (issued 02.97)	Plastic hydraulic hoses with textile ply	SAE 100 R7 SAE 100 R 8	PL 7 / ZL 7 PL 8 / ZL 8
DIN EN 856 (issued 02.97)	Hydraulic hoses with wire spiral reinforcement	– – SAE 100 R12 SAE 100 R13	4 SP 4 SH – –
DIN EN 857 (issued 02.97)	Compact hydraulic hoses with wire spiral reinforcement	– –	1 SC 2 SC

\* SAE standards only contain some of the requirements stipulated in DIN

### Terms

Standard	Subject
DIN 24 312 (issued 09.85)	Pressure: Values and terms
DIN 24 950-1 (issued 07.78)	Hose assemblies: terms
DIN 24 950-2 (issued 07.78)	Hose assemblies: Letters used for measurements
DIN 53 501 (issued 11.80)	Rubber and elastomers: terms

### Hose assemblies

Standard	Subject
DIN 20 066-1 (issued 02.82)	Hose assemblies: measurements, requirements
DIN 20 066-4 (issued 05.84)	Hose assemblies: installation
DIN 20 066-5 (issued 06.93E)	Hose assemblies: rating of reliability

### Hose fittings

Standard	Subject
DIN 20 078-1 (issued 02.82)	Hose fittings: requirements, installation instructions, testing

### Testing

Standard	Subject
DIN EN ISO 6803 (issued 07.97) (Replacement for DIN 20024)	Rubber and plastic hoses and hose assemblies: hydraulic pressure impulse testing without bending

## 1.6 Selection of the right type of hose using the nominal diameter and pressure ratings

Type	Spec. No.	DN															
		2	4	5	6	8	10	12	16	20	25	32	40	50	60	80	100
A	2234	20	20		15	15	15	15	15	15	12						
AH	2246		10		10	10											
GCN	2230	20	20		15	15	15	12	10								
GCNA	2277	30	30		30	25	25	25									
GCW	2225							25	15	15	15	15	10	10	10		
GCWA	2226							35	30	25	24	22	20	18	15		
GCDR/GCDRW	2286/2291							25	25	25	23	23	23	23			
GCADR/GCADRW	2287/2292							25	25	25	23	23	23	23			
OLN	2255	25	25	25	25	25	20	20	15	12							
OLNW	2731							20	15	12	10	8	6	5	5	5	5
OLNS 1	2370				40	35	30	25	25	25	25	32					
OLNH(W)	2265/2279	30	30		30	27	27	25	20	20	20	20					
KRAV 10	2102		10														
KRA 20	2264	25	25		10	10	15	15	10 <sup>5)</sup>								
SOH	2367								25	25	25	20	20	20 <sup>1)</sup>	20	15 <sup>4)</sup>	
DBSLK	2503/2508			10	10	10	10	10									
1 TE	2315			25	25	20	20	16	16	12	12						
2 TE	2335			80	75	68	63	58	50	45	40						
3 TE/3 TB	2336/2326			160	145	130	110	93	80	70	55	45	40	33	25	18	10
1 SN	2432				225	215	180	160	130	105	88	63	50	40			
1 SC	2460				225	215	180	160	130								
2 SN	2433				400	350	330	275	250	215	165	125	90	80			
2 SC	2437				400	350	330	275	250	215	165						
1 SC-HP	2923					250	225	190									
2 SN-HP	2410								290	275							
4 SP	2450				525		445	415	400	395							
4 SH (4 SPS)	2457									420 <sup>3)</sup>	420	420					
HPO b-mini	2322	320 <sup>2)</sup>															
HPC	2364		420		360												
2 SK	2491				400	350	330	275	250								
SR 1	2480				260	250	225	170	140	90	85						
PL7/ZL7*	2465/2915				200	180	160	135									
PL8/ZL8*	2466/2916				345	300	280										
TFS	2429			190	170	150	140	105	95								
TWS	2428					15	15	15	15	15							
PTFEW	2425										25	25	20				

\* on request also available as twin hose

1) = DN 46 / DN 50

2) = inside = 2.5 mm

3) = with special approval for 430 bar

4) = DN 85

5) = DN 15

■ Approval from German Lloyd with additional flame protection

■ Approval from German Lloyd without additional flame protection

**1.7.1 Selection of hose assemblies via the type of connection**

	Ferrule/shell Part No.	1 TE ** 2315	2 TE ** 2335	3 TE/3 TB 2336/2326	1 SN 2432	1 SC 2460	2 SN 2433	2 SC 2437	1 SC-HP 2923	2 SN-HP 2410	4 SP 2450	4 SH 2457
5	are only supplied as one-piece couplings	ML	ML/TL	TL								
6		ML	ML/TL	TL	TL	TL	TL	TL			TP	
8		ML	ML/TL	TL	TL	TL	TL	TL	TL			
10		ML	ML/TL	TL	TL	TL	TL	TL	TL		TP	
12		ML	ML/TL	TL	TL	TL	TL	TL	TL		TP	
16		ML	ML/TL	TL	TL	TL	TL	TL		TL	TLP	
20		ML	ML/TL	TL	TL		TL	TL		TL	WL	WL
25		ML	ML/TL	TL	TL		TL	TL				WL
32				TL	TL		TL					WL
40				TL	TL		TL					
50				TL	ES*		ES*					
60				UPR								
70				UPR								
80				NS*								
100			NS*									

	Ferrule/shell Part No.	HPO b-mini 2322	HPC 2364	2 SK 2491	PL7/ZL7*** 2465/2915	PL8/ZL8*** 2466/2916	SR 1 2480	TFS* 2429	TWS* 2428	PTFEW* 2425
5	are only supplied as one-piece couplings	* (DN 2,5)	* (DN 4)					*		
6			*	TL	TL	TL	TL			
8				TL	TL	TL	TL			
10				TL	TL	TL	TL			
12				TL		TL	TL			
16				TL			TL			
20							TL			
25							TL			
32										
40										
50										
60										
80										
100										

\* fittings on request  
 \*\* NLD insert ML crimped  
 \*\*\* on request also as twin hose available

## 1.7.2 Selection of hose assemblies via the type of connection

	Type Inner diam.	Ferrule/shell Part No.	A 2234	AH 2246	GCN 2230	GCNA 2277	GCW 2225	GCWA 2226	GCDR/GCDRW 2286/2291
2	10,5	32 4105 326 022	NK		NK				
2	11,5	32 4105 326 024				NK			
2	11,5	32 4112 326 022							
2	12	32 4112 326 024							
4	11,5	32 4105 326 042	NK	NK	NK				
4	13	32 4105 326 045				NK			
4	13	32 4112 326 041							
4	14	32 4112 326 043							
5	11,5	32 4105 326 024							
5	12	32 4112 326 024							
5	13,5	32 4112 326 023							
6	13	32 4112 326 041							
6	14	32 4112 326 043							
6	14	32 4105 326 064	NK	NK	NK				
6	14,5	32 4105 326 065				NK			
6	14,5	32 4112 326 061							
6	16	32 4112 326 062							
8	16	32 4112 326 062							
8	16	32 4105 326 082	NK	NK					
8	17	32 4105 326 084			NK				
8	17	32 4112 326 081							
8	17,5	32 4105 326 085				NK			
8	18	32 4112 326 083							
10	17	32 4112 326 081							
10	18	32 4112 326 083							
10	19	32 4105 326 101	NK		NK				
10	20	32 4105 326 102				NK			
10	20	32 4112 326 101							
10	21	32 4112 326 103							
12	19	32 4112 326 101							
12	21	32 4112 326 103							
12	21	32 4105 326 131	NK						
12	23	32 4112 326 141					NLD		NLD
12	24	32 4112 326 134			NLD				
12	25	32 4112 326 145					NLD		
12	26	32 4112 326 137				NLD			
16	25	32 4112 326 163							
16	27	32 4112 326 160			NLD		NLD		NLD
16	28	32 4112 326 162	NLD						
16	28	32 4112 326 165					NLD		
20	28	32 4112 326 162							
20	33	32 4112 326 201	NLD						
20	33	32 4112 326 203					NLD	NLD	NLD
25	36	32 4112 326 251							
25	38	32 4112 326 250	NLD				NLD	NLD	NLD
25	40	32 4112 326 252							
25		are only supplied							
32		as one-piece							
40		couplings					TL	TL	TL
50							TL	TL	TL
60		33 4061 473 601					UPR	UPR	
80		32 4001 780 800							
85		33 4061 473 851							
100		32 4001 780 910							

\* fittings on request \*\* NLD insert ML crimped \*\*\* (DN 40/46)

GCADR/GCADRW 2287/2292	OLN 2255	OLNW 2731	OLNS1 2370	OLNH(W) 2265/2279	KRAV 10 2102	KRA 20 2264	SOH 2367	DBSLK 2503/2508	1 TE ** 2315	2 TE ** 2335	3 TE/3 TB** 2336/2326
	NK			NLD	*	NK					
	NK			NLD		NK					
	NK							NLD	NLD	NLD	
			NLD					NLD	NLD	NLD	
	NK			NLD		NK					
			NLD					NLD	NLD		
	NK			NLD		NK					
			NLD					NLD	NLD		
	NK			NLD		NK				NLD	
			NLD					NLD	NLD		
NLD	NLD	NLD		NLD		NLD(DN14) NLD		NLD			
	NLD	NLD	NLD	NLD				NLD	NLD		
NLD							NLD				
NLD	NLD	NLD	NLD	NLD				NLD	NLD		
NLD			NLD	NLD				NLD	NLD		
				TL							
TL		TL	TL	TL			TL				
TL		TL					TL ***				
		UPR					ES*				
		NS*					UPR				
		NS*					UPR				

## 1.8 Notes on ordering

To ensure the prompt and trouble-free handling of your order, would you please observe the following procedure:

### A) Ordering individual parts

For individual parts such as hoses, shells, inserts, nuts and accessories, just give the part nos. from the corresponding tables.

#### Example 1:

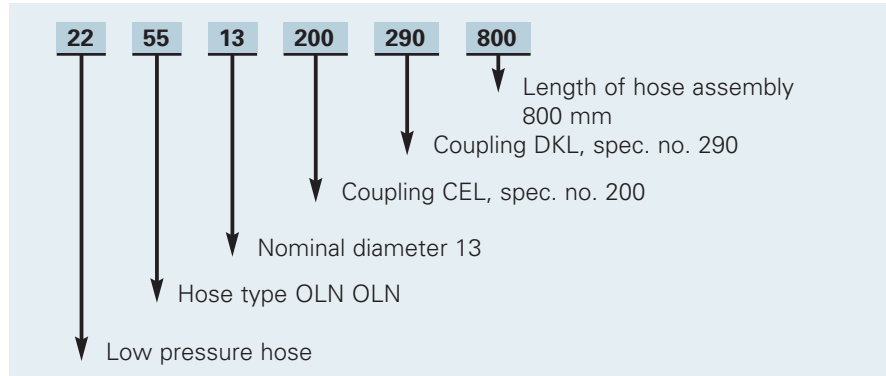
Hose:	OLN; type no. 2255; DN 12	Part no.:	<b>22 5513 000 000</b>
Shell :	DN 12 for OLN (ID 23 mm)	Part no.:	<b>32 4112 326 141</b>
Insert:	Coupling DKL; DN 12; NLD Spec. no. 290	Part no.:	<b>32 2247 483 130</b>
Nut:	M 22x1,5	Part no.:	<b>38 0531 491 130</b>
Adapter:	M 22x1,5	Part no.:	<b>39 5040 483 150</b>

#### Example 2:

Hose:	OLN; type no. 2255; DN 32	Part no.:	<b>22 5532 000 000</b>
One-piece Coupling:	Coupling DKLL; Spec. no. 300; DN; 32 TL	Part no.:	<b>04 0300 500 320</b>

### B) Ordering hose assemblies

The part numbers of complete ContiTech Techno-Chemie hose assemblies consist of 5 blocks of digits. The meaning of the constituent blocks is illustrated by the adjacent example. It refers to an OLN hose of nominal diameter of 12, a CEL coupling at one end and a DKL coupling at the other. The hose assembly is 800 mm long.



**Points to remember when ordering:**

1. For hose assemblies with TL, ML and WL couplings, the first digit of the hose type no. changes from 2 to B; e.g. from 225512... to B2 5512 ...

2. The nominal diameter of the hose should always be given as two digits in the part no.

Please write:	02 for DN 2	08 for DN 8
	04 for DN 4	13 for DN 12
	06 for DN 6	91 for DN 100

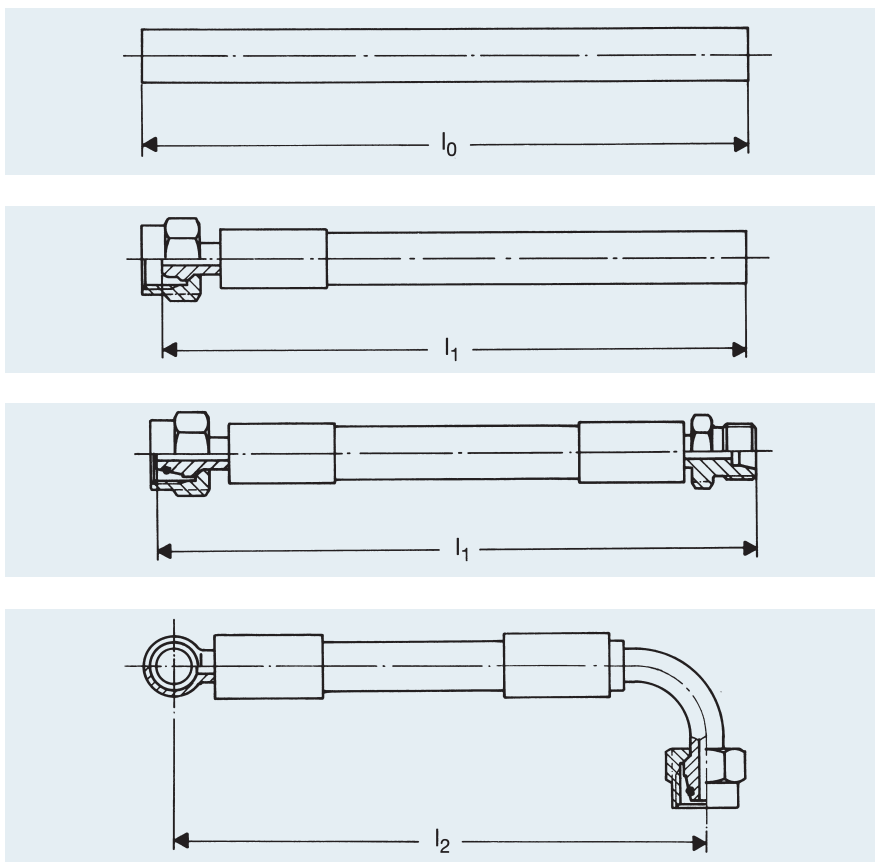
3. The types of coupling are defined by abbreviations and specification numbers.

Examples:	Abbrev.	Spec. no.
	BEL	100
	CEL	200
	DKL	290
Further abbreviations and spec. nos. are given in the coupling tables.		

4. A hose assembly with only one coupling is given the specification number 000 for the end without a coupling.

5. Determining the nominal length of hose assemblies.

Some examples for showing the lengths of hoses and hose assemblies are given here.



6. Recommended standard lengths  $l_1$  and  $l_2$  of hose assemblies.

160	400	1000	1800	4000	10000
200	500	1250	2000	5000	12500
250	630	1400	2500	6300	14000
315	800	1600	3150	8000	16000

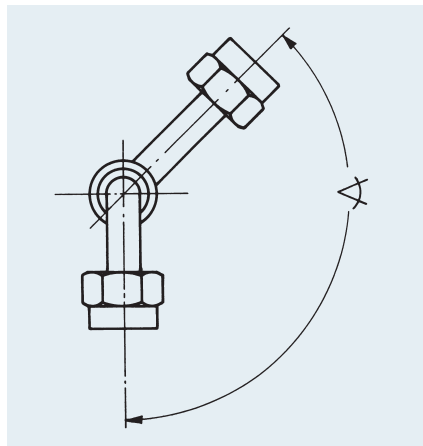
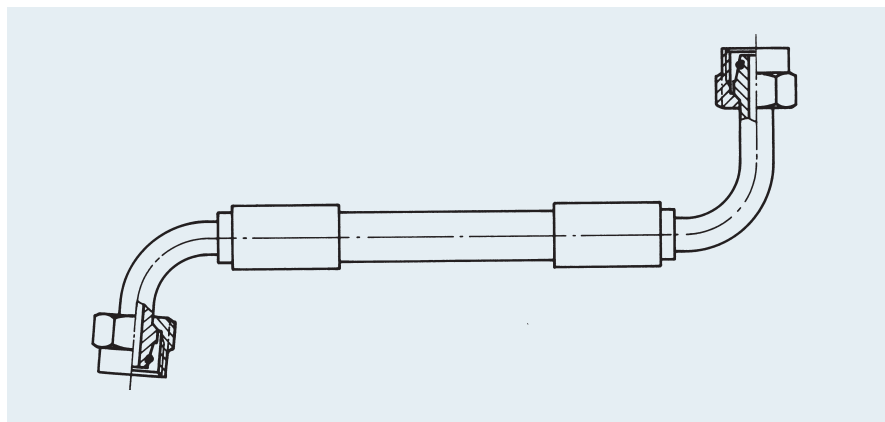
**Points to remember when ordering:**

7. Permissible deviations from measurements  $l_1$  and  $l_2$  for installed hose assemblies. The manufacturing tolerances comply with DIN 20066.

Length $l_1$ and $l_2$	Tolerance up to DN 25	from DN 32 up to DN 50	from DN 60 up to DN 100
up to 630	+ 7 - 3	+ 12 - 4	
from 630 to 1250	+ 12 - 4	+ 20 - 6	+ 25 - 6
from 1250 to 2500	+ 20 - 6	+ 25 - 6	
from 2500 to 8000	+ 1,5 % - 0,5 %		
over 8000	+ 3 % - 1 %		

8. Positioning of elbows on hose assemblies

- If no details are given to the contrary, the elbows are fitted in such a way that they both point in the same direction.
- If the elbows are to be turned round, the angle concerned must be stated. It is always given in a counter-clockwise direction.
- The elbow with the smaller bending angle always points down.



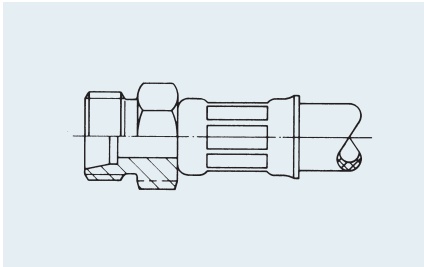
Couplings illustrated turned in plane of projection

**Illustrations**

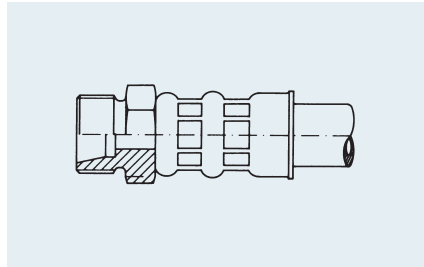
The various ContiTech Techno-Chemie hose couplings are referred to throughout the brochure (in both text and illustrations) by their abbreviation and in some cases illustrated uncrimped (for self-mounting presses).

The crimped version of the following types is illustrated for ease of understanding:

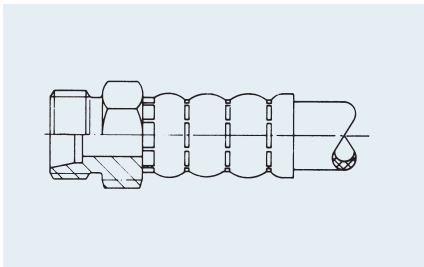
**NK-ML**



**NLD**

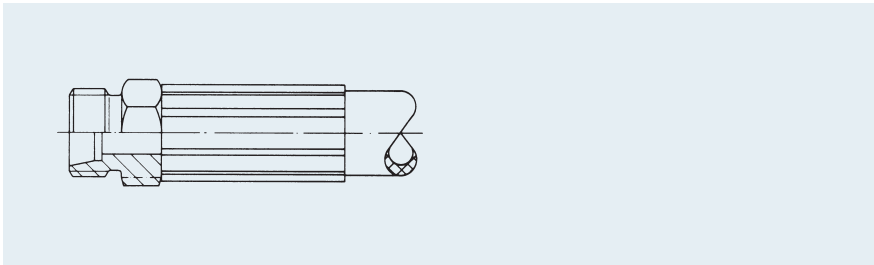


**TL**



**TP/TLP (DN 6-16)**

**WL (DN 20-32)**



After selection of hoses and connections, and with the help of our crimping data sheets on positioning the fittings, it is easy to complete hose assemblies using suitable crimpers.