



Marine

Technical manual

Legend

A. no. Article number
da..... Outside diameter
di..... Inside diameter (outside diameter minus wall thickness)
DN..... Outside diameter (Dimension Nominal)
H Height
L Length
UL Unit length in mm

General information

The information provided in this technical manual is intended to help you select our products for your application. Text and images were compiled with utmost care. Nevertheless, errors cannot be entirely excluded. POLOPLAST does not assume legal liability or any other form of liability for erroneous information and its consequences. POLOPLAST is grateful for any suggestions or comments. Subject to technical alterations.

We are happy to provide further information – please contact the POLOPLAST Sales Office on
T +43(0)732.3886, office@poloplast.com

Contents

General information

1.1	Scope.....	4
1.2	POLO-KAL NG and POLO-KAL NG Vacuum.....	4
1.3	Fields of application.....	5
1.4	Type approvals.....	5
1.5	Technical Notes	6

Pipe system - laying instructions

2.1	General information	9
2.2	Fastening.....	10
2.3	Installation guideline	10
2.4	Transport and storage.....	11
2.5	Cutting to length and bevelling.....	12
2.6	POLO-KAL NG ASV – Extraction-proof connection.....	13
2.7	Assembling of the cleaning pipe	14

Product range

3.1	POLO-KAL NG Vacuum and POLO-KAL NG . Pipes.....	15
3.2	POLO-KAL NG . Pipe fittings.....	16
3.3	POLO-EHP Control . Cleaning pipe.....	21
3.4	POLO-KAL NG . Lip seal rings.....	21
3.5	POLO-KAL NG Vacuum . Ball valve	22
3.6	POLO-KAL NG ASV . Extraction-proof for POLO-KAL NG.....	22
3.7	POLO-KAL NG . Flange.....	22
3.8	POLO-KAL NG . Adapter union.....	23
3.9	POLO-Accessories	23

1. General information

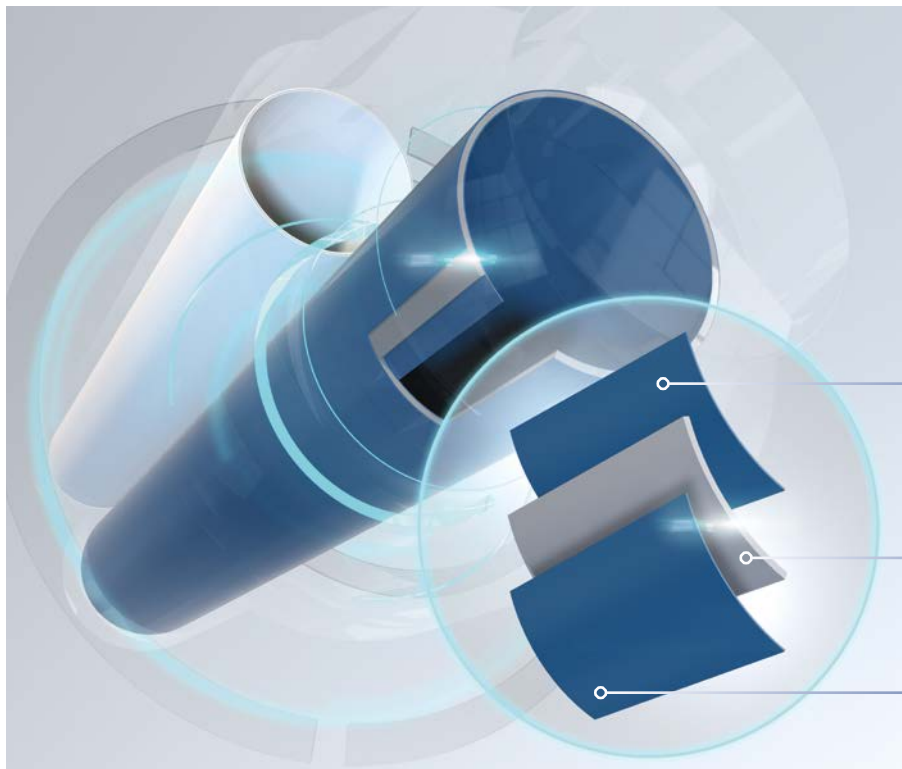
1.1 Scope

The scope of these specifications is to supply indications on the material, the design and installation of drainage systems POLO-KAL NG, respectively POLO-KAL NG Vacuum. The three-layer drainage system made of mineral reinforced polypropylene is suitable to use for whether black or grey water applications and is manufactured by POLOPLAST GmbH & CO KG.

1.2 POLO-KAL NG and POLO-KAL NG Vacuum

The POLO-KAL NG and POLO-KAL NG Vacuum is a polypropylene multi-layer non-pressure drainage system, comprising tubes and fittings with push-fit sockets and factory-inserted lip seals made of EPDM.

These pipes and fittings are commercial products with dimensions and quality according to EN 1451-1. The pipe consists of polypropylene in the inner and outer layer. The middle layer additionally contains minerals for reinforcement. The fittings consist of polypropylene and additionally minerals for reinforcement.



Internal layer made of PP

Tremendous surface smoothness and resistance to chemical agents.

The **mineral-reinforced middle layer** made from special compound materials of our own development.

External layer made of PP

The tough protective shell of the pipe. Sturdy and highly impact resistant.

The advantages of POLO-KAL NG

- **Outstanding noise insulating values.** The tried and tested 3-layer technology reliably absorbs flow noise effectively.
- **Low weight** of the pipe system, reduces the total weight of the ship significantly and enables easy transportation and assembling.
- **Long-living and non-corrosive** – optimal resistance to salt-containing air, no corrosion.
- **High assembling security** provided by the established push-fit system. No risk of fire, due to sparks caused by cutting the pipes.
- **Fast and easy assembling** of the highly noise-insulated push-fit system POLO-KAL NG.
- **Smooth inner surface** prevents the accumulation of deposits.
- **Precision sealing system.** Precisely-shaped push-fit sockets. Rapid assembly. Durable connection.
- **30 years of multi-layer technology experience.** POLOPLAST has more than 30 years of knowledge and experience with the tried and tested 3-layer technology and 60 years of experience with building drainage.

1.3 Fields of application

The pipe system is produced in a series of diameters from DN 32–200, and is particularly suitable for the following fields of application:

- **Gravity drainage for grey- and rainwater including internal and external scuppers.**
The POLO-KAL NG pipes and fittings (DN 32–200), deliver a convincing performance distinguished by superior quality and excellent noise insulation values.
- **Vacuum discharge for black water (DN 32–160).** The POLO-KAL NG Vacuum pipes in combination with the POLO-KAL NG fittings, deliver a reliable and long lasting performance, even at the demanding vacuum discharge application.
- **Air vent for fresh water, ballast, grey and black water tanks.**

The pipe system is made up of a series of diameters from 32 to 200.

Nominal size = outside diameter [mm]	Pipe minimal wall thickness	
	POLO-KAL NG Vacuum for gravity and vacuum discharge	POLO-KAL NG for gravity discharge
DN 32	1.8 mm	-
DN 40	1.9 mm	-
DN 50	2.3 mm	-
DN 75	3.8 mm	-
DN 90	4.5 mm	-
DN 110	4.8 mm	-
DN 125	5.3 mm	-
DN 160	7.5 mm	-
DN 200	-	6.8 mm

The fittings of POLO-KAL NG can be used for gravity drainage and vacuum discharge.

With reference to the use of this system, Res. A.753 (18) of the International Maritime Organization (I.M.O.) for the application of plastic pipes on board ships applies. The POLO-KAL NG system can be adopted under freeboard deck only if kept within the compartment and according to limitations in type approval certificates issued by classification societies. Only system components which are part of type approval have clearance for use.

Applications under direct UV-radiation are not permitted.

1.4 Type approvals



Certificate No. MAC068914XG



Certificate No. 12-00016_(E2)



TAK00001J3

1.5 Technical Notes

1.5.1 Crossing decks and bulkheads

Decks and bulkheads without class specifications

The pipes can be implemented through the decks and bulkheads without special measures.

To avoid damage to pipes due to possible contact with the deck or bulkhead holes the following precautionary actions shall be taken:

- The minimum clearance between pipes of all diameters and the hole in the plate has to be 20 mm.
- When applying a securing clamp make sure to keep a maximum distance of 200 mm from the hole.



Decks and bulkheads with class specifications

When fire prevention areas with fire protection class A or B are crossed by plastic pipes, arrangements should be made to ensure that the fire security is not affected.

These regulations should be consistent for fire protection certification for A and B. The fire protection sleeve has to be tested and approved in combination with our products. Such approvals can be requested directly from the fire protection sleeve manufacturers.

The installation has to be done according to the guidelines of the fire protection sleeve manufacturer.

1.5.2 Technical data POLO-KAL NG

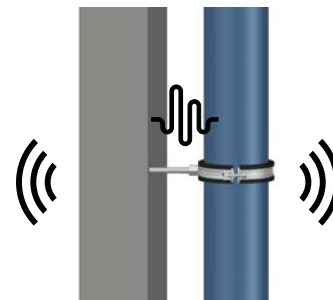
	POLO-KAL NG Vacuum	POLO-KAL NG
		
Diameter	DN 32-160	DN 200
Material	Pipe: PP/PP-MV/PP; Fitting: PP-MV free of halogen and cadmium and free of heavy metals	
Colour	Blue RAL 5014	
Gravity drainage application temperature	Long-term 60 °C - 5 h/day = 87.600 h/50 years Short-term 90°C - 10 min/day = 3.000 h/50 years	
Vacuum application temperature	45 °C	-
Chemical resistance	Pipes and fittings made of PP according DIN 8078, Supplement 1, seal material according ISO TR7620 resistant to pH values from 2 to 13.	
Connections	Push-fit sockets with factory-inserted lip seals. Seal material = EPDM (DN 200 it is NBR)	
Fire behaviour	according EN 13501-1: D - s2, d1 according DIN 4102: B2 (normal inflammability) Q1 (low smoke development) TR1 (no drip formation) according EN 60695-11-10/UL94: HB	
Ring rigidity according EN ISO 9969	≥ 18,0 kN/m ²	≥ 8,0 kN/m ²
Pressure	max. 1.5 bar short-term	
Vacuum Pressure	max. -0,9 bar	-
E-Modulus	2400-3100 MPa according to ISO 178	
Mean coefficient of elongation LAG	0.05 mm/mK (OFI test report No. 47.423)	
Low-temperature impact strength	❄ -20 °C, safe transportation and laying, even at low temperatures. (Test report TGM VA KU 25000/1)	
UV-Resistance	POLO-KAL NG pipes and fittings are designed to withstand outdoor storage for 2 years in Europe.	

1.5.3 Soundproofing

The POLO-KAL NG considerably reduces the noise produced by the flow of water.

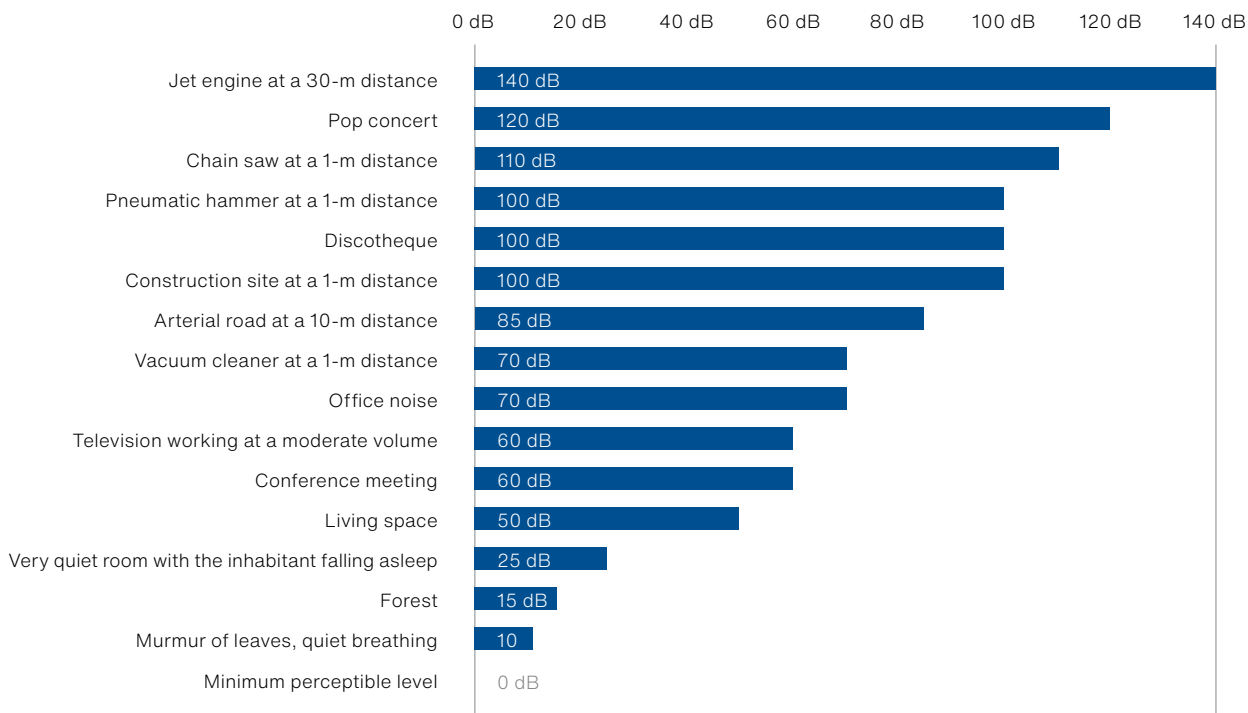
Tests conducted at the Fraunhofer Laboratory in Stuttgart (Germany) have proved the highly sound insulating properties of this pipe system. Thanks to the standardised test set-up in compliance with the EN 14366 standard, the acoustic properties can be assessed in an unbiased way.

The POLO-KAL NG is installed on a concrete wall with a mass per surface unit equating to 220 kg/m². Pipes and fittings in the dimension of 110 mm were used.



Under these conditions the noise level in the metering chamber reached $L_{AFeq,n} = 22 \text{ dB(A)}$ at a water flow rate of 4 l/s.

In the described circumstances, POLO-KAL NG provides a sound level as low as in an average bedroom.



1.5.4 Linear expansion

If the working temperature is higher than the installation temperature the pipe expands. These expansion forces have to be absorbed by the pipe and the fixing system.

With a pipe length of up to 10 m and an expected temperature difference of no more than 15 Kelvin, no special measures for linear expansion are required.

In the case of high wastewater temperatures the linear expansion can be calculated as shown below:

$$\text{Linear expansion [mm]} = \text{LAK [mm/mK]} \times \text{difference in temperature } [\Delta t] \times \text{straight pipe length [m]}$$

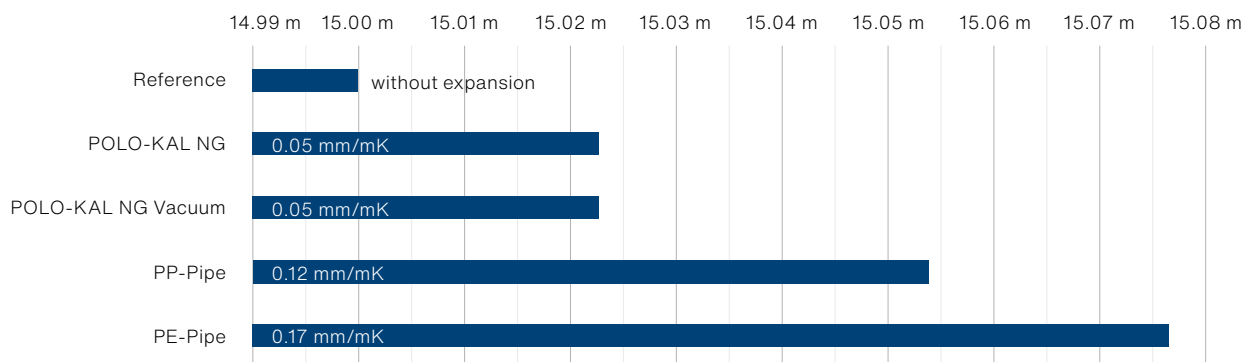
Pipe system	LAK
POLO-KAL NG	0.05 mm/mK
POLO-KAL NG Vacuum	0.05 mm/mK

Example:

A POLO-KAL NG pipe has a straight length of 15 m. Given an ambient temperature of 25 °C, wastewater is conducted at a maximum temperature of 55 °C. This results in a temperature difference of 30 Kelvin.

Linear expansion = 0.05 mm/mK × 30 K × 15 m = 22.5 mm

A linear expansion of ca. 2 cm can thus be expected. Other pipe materials have a linear expansion up to 8 cm.



Instances of linear expansion can be compensated by drawing out the spigot ends of several push-fit connections by no more than 1 cm. Alternatively, long sleeve sockets can be used in the traditional way.

1.5.5 Use in commercial kitchens

POLO-KAL NG is suitable to be used for draining away greasy waste water from canteen kitchens to grease traps. The factory-fitted lip ring seals need to be replaced by oil and grease resistant NBR lip ring seals. Downstream of the grease trap, all POLO-KAL® pipe systems can be used.

As far as supply lines and the operation of grease traps are concerned, the requirements of the EN 1825 standard, as well as the requirements indicated by the grease trap manufacturer, apply. As an optional solution, electric heat tracing can be installed up to the grease trap. The surface temperature of the electric heat tracing must not exceed 45 °C.

1.5.6 Use with commercial devices

In case of drainage of dish washing machines, potwashers and potwash tables, kettles, Bain Marie of distribution counters, laundry machines or similar consider the maximum temperatures according section 1.5.2.

1.5.7 Maintenance

Due to the material properties of polypropylene in general and the material mix as well as the low surface tension of the POLO-KAL NG and POLO-KAL NG Vacuum pipe system in particular, the incrustation process (scaling) can be prolonged.

Nevertheless, with time every marine sewage system becomes eventually lined up with a certain build-up of calcium, magnesium hard water scale and struvite deposits. For this case, various cleaning methods are existing, using different kinds of chemicals. The POLO-KAL NG pipe system as well as the POLO-KAL NG Vacuum pipes are tested with the following substances:

- Hydrochloric acid up to 42 % concentration
- Phosphoric acid up to 25 % concentration
- Sulfuric acid up to 50 % concentration
- Caustic soda

For use of other aggressive chemicals, please contact us.

2. Pipe system - laying instructions

2.1 General information

2.1.1 Couplings

Lubricant specification

POLOPLAST lubricant is only designed for POLOPLAST products and must not be used for stainless steel or any other steel pipe connection.

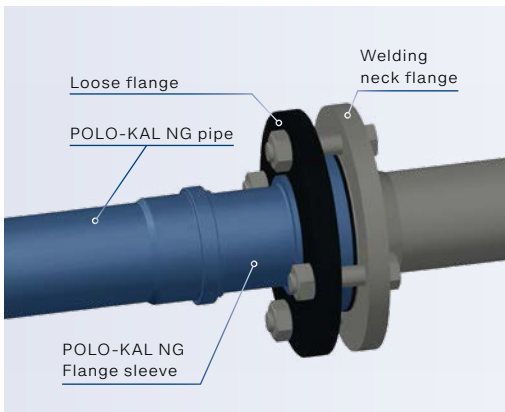
Coupling PP pipes

The POLO-KAL NG is a demountable and re-usable push-fit pipe system. When setting up the plug connection make sure to always use an appropriate lubricant.

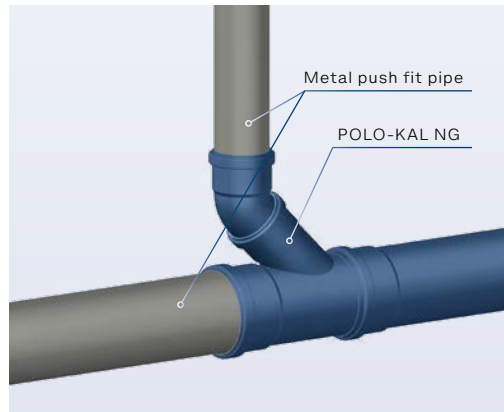
Coupling PP pipes to flanged fittings or components

Flanged couplings are used for coupling of PP with:

- Pipes of different material
- Valves or other flanged fittings
- PP pipes where needed for installation requirements



By means of POLO-KAL NG Flange sleeve and loose flange. Suitable for coupling of POLOKAL NG pipe system and pipe systems of different materials.



The POLO-KAL NG Pipe system can be coupled to metallic push-fit pipe systems which have the same outer diameter.

Coupling PP pipes and threaded accessories

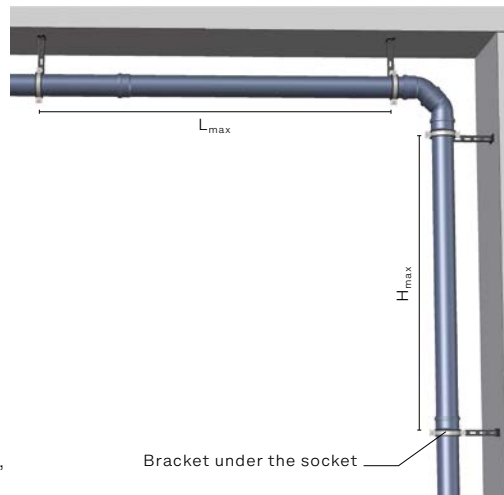
In some cases it is necessary to couple PP pipe elements to threaded accessories. Adapters are available in the dimension DN 32 to DN 50 with a male or a female thread.

2.2 Fastening

2.2.1 Maximum distance between brackets

To maintain sagging within the limits of applicable standard (EN 1451-1 and EN 1055) the following maximum distance between fastening points are recommended for POLO-KAL NG and POLO-KAL NG Vacuum.

DN	Distance between fixed brackets	
	Horizontal pipe routing L_{max}	Vertical pipe routing H_{max}
32	0.80 m	1.40 m
40	0.90 m	1.40 m
50	1.00 m	1.80 m
75	1.40 m	2.70 m
90	1.55 m	2.70 m
110	1.80 m	2.70 m
125	1.90 m	2.70 m
160	2.00 m	2.70 m
200	2.40 m	2.70 m



Directly besides heavy fittings and pipe components, e.g. flange piece or valves, there must be suitable fixpoints.

2.2.2 Brackets

Customary galvanized steel brackets with rubber insert can be used. Be sure that the brackets and the cantilever can withstand any forces which may occur. All brackets are fix-brackets, so no sliding between the pipe and the bracket is allowed. It is important to not deform the pipes when tightening the brackets.

The following additional points must be observed during the professional installation of pipes using brackets with variable diameter: **Due to the span tolerance (e.g. 108–114 mm in the case of Bismat 2000, DN 110) the fixed bracket must not be fully tightened!** This represents an installation flaw, which – amongst other things – leads to a significant increase of flow noise transmission to adjacent rooms.



2.3 Installation guideline

1. Use brackets to hold the weight of the pipe. To avoid sagging of the pipe the distance between the fix-brackets must not exceed the distances which are defined in section 2.2.1.
2. To avoid pull out of the push-fit connection, the fixing system has to be designed to absorb ship hull vibrations, axial forces due to unexpected inside pressure or due axial impulse caused from vacuum discharge. Fix the push-fit system with the support of brackets to a wall or rigid elements. It is recommended to use brackets before and after each change in direction.

3. During the construction each pipe section must be checked with a pressure test (water with max. 1.5 bar) to ensure the tightness of the pipeline and the quality of the fixing system. If parts of installation can't fix by brackets, POLO-KAL NG ASV is to be used. The pressure test should be make for each deck separate.
4. To secure socket plugs against pull out POLO-KAL NG ASV collar is to be used.
5. For vacuum discharge, it is recommended to use the POLO-KAL NG ASV at every push-fit connection. In case of straight lines without change in direction between two brackets, no POLO-KAL NG ASV is necessarily needed. In the case of directional change of the pipe line every socket between the fixing points has to be secured with POLO-KAL NG ASV collar.

2.4 Transport and storage

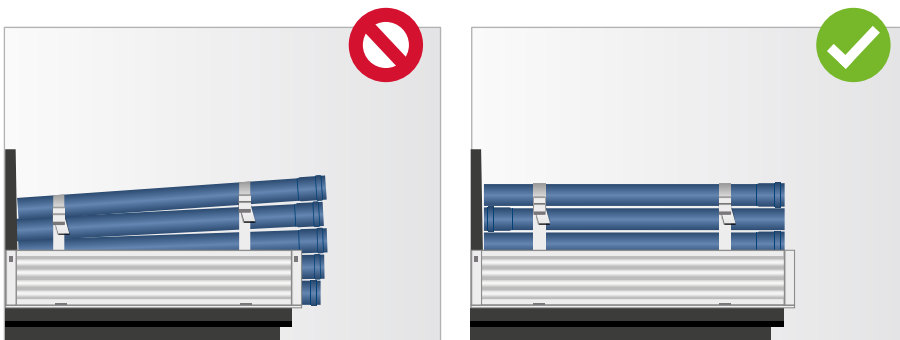
Take care that no damage can occur during transportation when loading pipes and fittings.

During transportation the pipes should rest on top of each other at full length (when no longer in the original packing) to avoid sagging. The sleeves have to be placed offset. Avoid sudden and abrupt stresses on pipes and fittings, especially concerning temperatures around and below 0 °C.

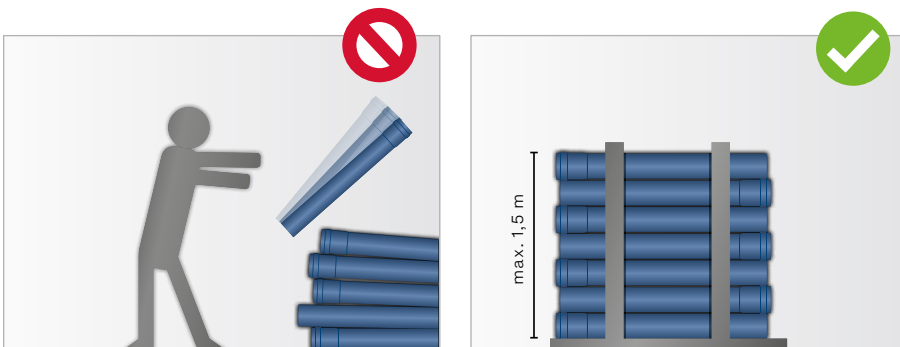
Storage temperature down to -20 °C possible
Installation temperature -5 °C to 40 °C

The outdoor storage under direct sunlight of pipes (with pre-installed gasket) has to be limited to 24 months from the date of production. Fittings must not be exposed to direct sunlight for a period greater than 6 months. Such exposure can lead to discoloration but technical performance won't be affected.

The pipes have to be stored on smooth, flat surfaces.



Loading and transportation



Unloading

2.5 Cutting to length and bevelling

1. Mark the desired length on the pipe

Take note of socket size if necessary.



2. Cutting the pipe to length

Cut the pipes to length at right angles to the pipe axis.

The following tools can be used:

- Fine-tooth saw
- Angle grinder
- Reciprocating / universal saw
- Suitable pipe cutter

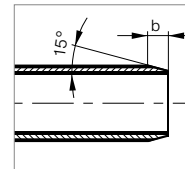


Fittings must not be cut to length.

3. Bevel the cut edge

Bevel pipe end at an angle of 15° approx. with a chamfering tool or grater.

DN	32	40	50	75	90	110	125	160	200
b ca. mm	4	4	4	4	5	6	6	7	8



4. Debur the cutting edges

Use a pipe deburring tool or a knife to remove all burrs on the inside and on the outside (remove chips and break off edges).



5. Cleanliness

Make sure the components are clean and undamaged.

If necessary, remove any dirt from socket, sealing ring and spigot end.

Check the position of the lip seal in the socket.



6. Lubricant

Apply a thin layer of POLOPLAST lubricant over spigot end.



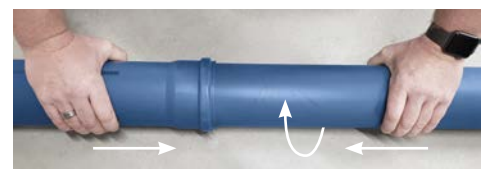
7. Connect

Push-in the spigot end **while turning it slightly** until the insertion depth is reached.

Connections between fittings can remain fully inserted.

If using the extraction-proof connection POLO-KAL NG ASV, also fittings have to be retracted from the push-fit connection by 5 mm.

This is necessary to create enough space for the extraction-proof connection.



2.6 POLO-KAL NG ASV – Extraction-proof connection

2.6.1 Fields of application




In combination with the POLO-KAL NG ASV extraction-proof connection, POLO-KAL NG, which has been approved as pressureless building drainage system, allows the absorption of intermittent dynamic strain, caused by excess pressure, low pressure, and/or vibration. POLO-KAL NG ASV is approved to be used exclusively in combination with the POLO-KAL NG and POLO-KAL NG Vacuum pipe system.

The POLO-KAL NG ASV extraction-proof connection opens up new fields of application for the POLO-KAL NG pipe system:

- **As vacuum pipe system** using POLO-KAL NG Vacuum pipes of the dimensions DN 32 to DN 160.
- **As pressure line for water raising systems** using POLO-KAL NG Vacuum pipes and POLO-KAL NG bends until the dimension DN 90. Maximum pressure surges must be established in advance through communication with the equipment manufacturer and must be taken into consideration with regard to the maximum admissible pressure load.
- **For interior downpipes** to ensure safety conforming to standards in the case of a backwater level of up to 20 m.
- **To secure socket plugs**
Prior to the assembly of the POLO-KAL NG ASV, the plug must be pulled out of the socket by 10 mm.
- **To secure against the elements sliding apart** due to mechanical loads and vibrations.

2.6.2 Assembly of POLO-KAL NG ASV

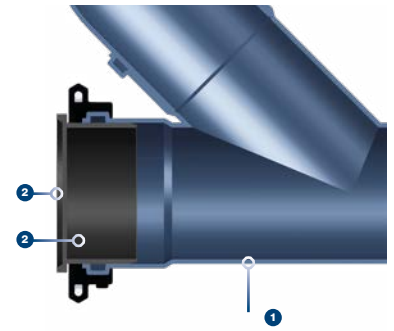
For use with POLO-KAL NG and POLO-KAL NG Vacuum only. Not suitable for use with other pipe systems.

<p>1. Before fitting the POLO-KAL NG ASV over the socket, disassemble it.</p>	
<p>2. Establish the socket connection. Transition pipes, socket plugs and fittings with a short spigot end need to be retracted from the socket by approximately 5 mm. This is required to allow sufficient space for the extraction retainer. The half-shells have to be put together over the socket connection.</p>	
<p>3. Now tighten the screw. The maximum admissible torque is: DN 32–75: 1 screw, 5–7 Nm DN 90–200: 2 screws, 7 Nm</p>	

2.7 Assembling of the cleaning pipe

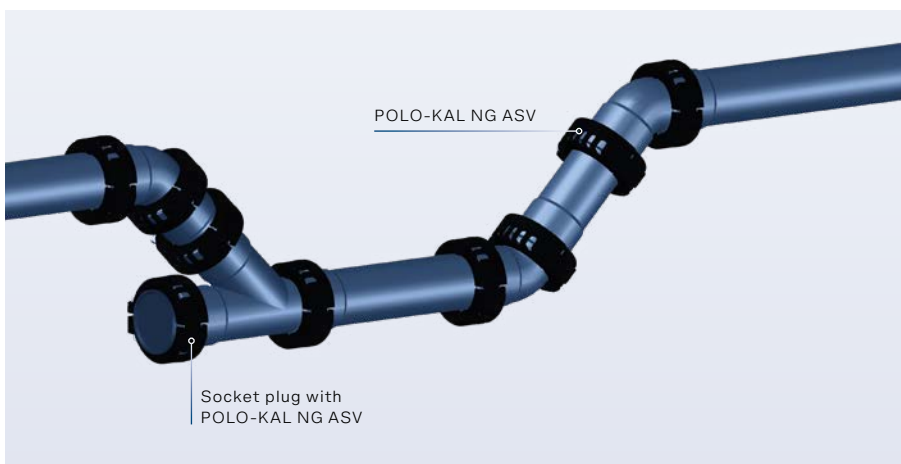
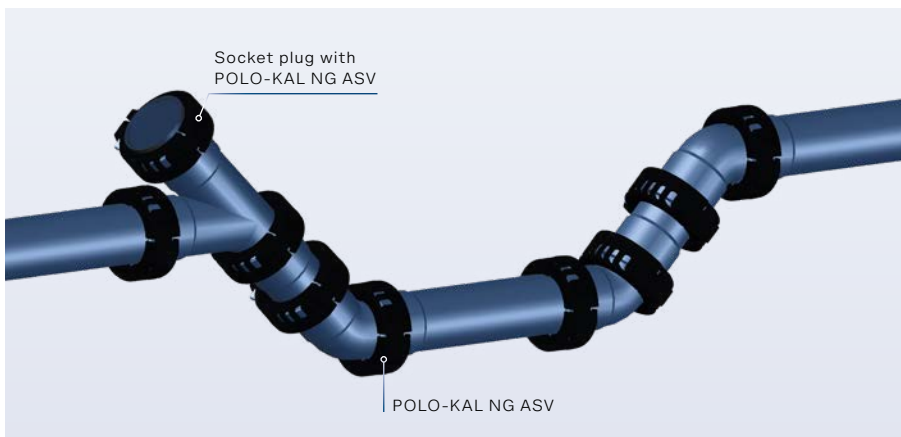
The cleaning pipe consists of three parts which are delivered separately and have to be assembled locally.

Insert the socket plug into the branch and pull it 1 cm back. Mount the connection with POLO-KAL NG ASV. Ensure that the claws of the POLO-KAL NG ASV are located on the spigot.



- 1 Single branch 45°
- 2 Socket plug
- 3 POLO-KAL NG ASV



2.7.1 Assembling of transport pockets



3. Product range

3.1 POLO-KAL NG Vacuum and POLO-KAL NG . Pipes

Three-layer drain pipes of highly sound-insulating mineral-reinforced polypropylene.

POLO-KAL NG Vacuum Socket pipe PKVEM			DN			UL			A. no.													
	32 di = 28,4 mm	250	01401	40 di = 36,2 mm	250	01411	50	01402	75	01412	100	01403	150	01413	200	01404	2000	01414	3000	01415	3000	01416
		500	01405		500	01417		1000		01418												
		750	01406		1500	01419		2000		01420												
		1000	01407		2000	01421		3000		01422												
		1500	01408		2500	01423		3000		01424												
		2000	01409		3000	01425		3000		01426												
	50 di = 45,4 mm	250	01427	75 di = 67,4 mm	250	01431	100	01428	150	01432	200	01429	2000	01433	3000	01434	2000	01435	3000	01436	3000	01437
		500	01430		500	01438		1000		01439												
		750	01431		750	01440		1500		01441												
		1000	01432		1000	01442		2000		01443												
		1500	01433		1500	01444		3000		01445												
		2000	01434		2000	01446		3000		01447												
	90 di = 81,0 mm	250	01448	110 di = 100,4 mm	250	01451	150	01449	200	01452	2000	01453	3000	01454	2000	01455	3000	01456	3000	01457		
		500	01450		500	01458		1500		01459												
		750	01451		750	01460		2000		01461												
		1000	01452		1000	01462		3000		01463												
		1500	01453		1500	01464		3000		01465												
		2000	01454		2000	01466		3000		01467												
	125 di = 114,4 mm	250	01468	160 di = 145,0 mm	250	01461	1500	01469	2000	01472	3000	01475	2000	01478	3000	01481	2000	01484	3000	01487		
		500	01470		500	01473		1500		01476												
750		01471	750		01474	2000		01477														
1000		01472	1000		01475	3000		01478														
1500		01473	1500		01476	3000		01479														
2000		01474	2000		01477	3000		01480														
POLO-KAL NG Socket pipe PKEM			DN			UL			A. no.													
	200 di = 186,4 mm	1000	02951	3000	02952	6000	02953	6000	02954													
		3000	02952																			
		6000	02953																			

3.2 POLO-KAL NG . Pipe fittings

**Bend
PKB**



DN	Angle	A. no.	DN	Angle	A. no.
32	15°	02100	40	15°	02110
	30°	02101		30°	02111
	45°	02102		45°	02112
	67.5°	02103		67.5°	02113
	87.5°	02104		87.5°	02114
DN	Angle	A. no.	DN	Angle	A. no.
50	15°	02120	75	15°	02130
	30°	02121		30°	02131
	45°	02122		45°	02132
	67.5°	02123		67.5°	02133
	87.5°	02124		87.5°	02134
DN	Angle	A. no.	DN	Angle	A. no.
90	15°	02170	110	15°	02140
	30°	02171		30°	02141
	45°	02172		45°	02142
	67.5°	02173		67.5°	02143
	87.5°	02174		87.5°	02144
DN	Angle	A. no.	DN	Angle	A. no.
125	15°	02150	160	15°	02160
	30°	02151		30°	02161
	45°	02152		45°	02162
	67.5°	02153		67.5°	02163
	87.5°	02154		87.5°	02164
DN	Angle	A. no.	DN	Angle	A. no.
200	15°	02960	200	15°	02960
	30°	02962		30°	02962
	45°	02963		45°	02963
	87.5°	02965		87.5°	02965

**Branch
PKEA**



* Swept entry branch
90/90/87.5°
110/110/87.5°

Angle	DN	A. no.	Angle	DN	A. no.
	32/32	02200		40/40	02207
	40/32	02203		50/40	02213
	40/40	02206		50/50	02216
	50/32	02209		75/50	02219
	50/40	02212		75/75	02222
	50/50	02215		90/50	02835
	50/50	01516**		90/75	02832
	75/50	02218	67.5°	90/90	02831
	75/75	02221		110/50	02225
	90/50	02210		110/75	02228
	90/75	02834		110/90	02837
	90/90	02211		110/110	02231
	110/40	02204		125/90	02844
45°	110/50	02224		125/110	02237
	110/75	02227		160/110	02243
	110/90	02839			
	110/110	02230	Angle	DN	A. no.
	125/75	02233		40/40	02208
	125/90	02843		50/40	02214
	125/110	02236		50/50	02217
	125/125	02239		75/50	02220
	160/90	02840		75/50	01513**
	160/110	02242		75/75	02223
	160/125	02240		90/50	02830
	160/160	02245		90/75	02833
	200/160	02971		90/90	02248*
	200/200	02973		110/50	02226
			87.5°	110/75	02229
				110/90	02836
				110/110	02232*
				125/75	02235
				125/90	02845
				125/110	02238
				125/125	02241
				160/90	02842
				160/110	02244
				160/125	02246
				160/160	02247
				200/160	02972
				200/200	02974
			Angle	DN	A. no.
				50/50	01467
				110/75	01468
				160/75	01470
			93°	160/160	01469
				200/110	01471
				200/125	01472
				200/160	01473
				200/200	01474

** extended spigot end

**Double branch
PKDA**



* Double branch with radius
90/90/87.5°
110/110/87.5°

Angle	DN	A. no.	Angle	DN	A. no.
45°	50/50/50	01512	67.5°	90/50/50	02848
	50/50/50	01517**		90/90/90	02846
	75/50/50	02295		110/50/50	02260
	75/75/75	02396		110/110/110	02261
	110/50/50	02258		125/110/110	02262
	110/75/75	02398		160/110/110	02264
	110/110/110	02259	87.5°	50/50/50	01515
	125/110/110	02234		75/50/50	01519
	160/110/110	02399		75/50/50	01520**
	160/160/160	01514		75/75/75	02265
			90/90/90	02847*	
			110/50/50	02255	
			110/75/75	02269	
			110/110/110	02267*	
			125/110/110	02272	
			160/110/110	02274	

** extended spigot end

**Double corner branch
equal bottom, 90°
PKEDA**

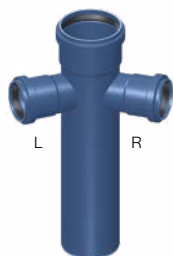


* dismount DN 90 / DN 110
as swept entry branch

Angle	DN	A. no.	Angle	DN	A. no.
45°	75/L50/R50	01526	87.5°	50/50/50	01537
	110/L50/R50	01530		75/L50/R50	01546
	110/L75/R75	01531		75/L50/R50	01545**
	160/L110/R110	01535		75/75/75	02297
		90/L50/R90		02827*	
		90/L90/R50		02826*	
		90/90/90		02829	
		110/L50/R110		02838*	
		110/L110/R50		02291*	
		110/L75/R75		01541	
		110/L75/R110		02279	
		110/L110/R75		02277	
		110/110/110		02275	
		125/L110/R110		02276	
		160/L110/R110	02278		
		160/160/160	01543		

** extended spigot end

**Double corner branch
equal bottom, 135°
PKEDA**



Angle	DN	A. no.
87.5°	75/L50/R50	01544*

* extended spigot end

**Verticale double branch
PKVDA**



Angle	DN	A. no.
87.5°	90/90/50	01945
	110/90/50	01946
	110/110/50	01947

**Parallel branch
PKPA**



DN	A. no.
90/90	02828
110/110	02294

**Combo branch
PKKA**



Angle	DN	A. no.
87.5°	90/L90/R75	02329
	90/L75/R90	02328
	110/110/110	02296
	110/L110/R75	02268
	110/L75/R110	02273

**Adapter
PKR**



DN	A. no.
40/32	02280
50/32	02281
50/40	02282
75/50	02283
90/40	01511
90/50	02885
90/75	02886
110/50	02284
110/75	02285
110/90	02887
125/110	02286
160/110	02287
160/125	02288
200/160	02981

**Adapter short
PKRK**



DN	A. no.
50/40	02330
75/50	02875
80/75	02882
90/50	02292
90/75	02289
110/50	02876
110/75	02877
110/90	02290
160/110	02878

NEW

Reducer for vacuum breaker



DN	A. no.
75/40	01510

**Long socket
PKL**



DN	A. no.
40	02331
50	02332
75	02333
90	02338
110	02334
125	02335
160	02336
200	02339

**Double socket
PKD**



DN	A. no.
32	02300
40	02301
50	02302
75	02303
90	02307
110	02304
125	02305
160	02306
200	02986

**Slip-on sleeve
PKU**
with double lip seal ring



DN	A. no.
40	02311
50	02312
75	02313
90	02319
110	02314
125	02315
160	02316
200	02984

**Socket plug
PKM**



DN	A. no.
32	02320
40	02321
50	02322
75	02323
90	02327
110	02324
125	02325
160	02326
200	02990

**Siphon connection piece
PKS**
with plug-in seal



DN	Connecting element	A. no.
32	32 mm 1 1/4"	02350
40	32 mm 1 1/4"	02351
40	40 mm 1 1/2"	02352
50	32 mm 1 1/4"	02353
50	40 mm 1 1/2"	02354
50	50 mm 2"	02355

**Siphon connection knee
PKSW**
with plug-in seal



DN	Connecting element	A. no.
32	32 mm 1 1/4"	02360
40	32 mm 1 1/4"	02361
40	40 mm 1 1/2"	02362
50	32 mm 1 1/4"	02363
50	40 mm 1 1/2"	02364
50	50 mm 2"	02365

**Plug-in seal
PKNI**
for siphon fitting



Connecting element	A. no.
32 mm 1 1/4"	01552 new
32 mm 1 1/4"	02378 old *
40 mm 1 1/2"	01553 new
40 mm 1 1/2"	02379 old *
50 mm 2"	02380

* for siphon fitting with di = 54 mm before 2018

3.3 POLO-EHP Control . Cleaning pipe

POLO-EHP Control
PKEHP
 in blue for POLO-KAL NG



DN	A. no.
110	01900
125	01901
160	01902
200	01903

Replacement cover for POLO-EHP Control



DN	A. no.
110-125	07815
160-200	07816

POLO-EHP Control Security clamp

Prevents unauthorized opening of cleaning pipe
 POLO-EHP Control (vandalism protection)



DN	A. no.
110-200	07818

3.4 POLO-KAL NG . Lip seal rings

Spare lip ring EPDM for POLO-KAL NG
PKLI
 except for slip-on sleeves



DN	A. no.
32	02750
40	02751
50	02752
75	02753
90	02754
110	02755
125	02756
160	02757
200	02937

NBR-lip seal ring for POLO-KAL NG
PKNL

oil- and grease-resistant, radon-proof



DN	A. no.
50	00149
75	00150
90	00151
110	00152
125	00153
160	00154
200	00155

Seal rings are highlighted yellow

Lip seal ring silicone for POLO-KAL NG
PKLISB
 high temperature resistant



DN	A. no.
50	00170
75	00171
90	00172
110	00173
125	00174
160	00175

Spare double lip ring seal for POLO-KAL NG

PKDL
for slip-on sleeve



DN	A. no.
40	02940
50	02941
75	02942
90	02946
110	02943
125	02944
160	02945
200	02947

3.5 POLO-KAL NG Vacuum . Ball valve

POLO-KAL NG Vacuum
Ball valve



DN	A. no.
32	03641
50	03643
75	03644

3.6 POLO-KAL NG ASV . Extraction-proof for POLO-KAL NG

Extraction-proof
PKASV

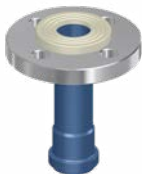


DN	A. no.
32	01560
40	01561
50	01562
75	01563
90	01564
110	01565
125	01566
160	01567
200	01568

3.7 POLO-KAL NG . Flange

Flange piece

with socket and flange compatible
to gasket acc. EN 1514-1



Nominal pressure	DN	A. no.	Nominal pressure	DN	A. no.
PN 6	40	01497	PN 16	40	01503
	50	01498		50	01504
	75	01499		75	01505
	90	01500		90	01506
	110	01501		110	01507
	125	01476		160	01508
	160	01502		200	01509
	200	01478			

Flange sleeve

with spigot compatible to gasket acc. EN 1514-1,
compatible to flange acc. EN 1092-1, type 4



Nominal pressure	DN	A. no.	Nominal pressure	DN	A. no.
PN 6	40	01485	PN 16	40	01491
	50	01486		50	01492
	75	01487		75	01493
	90	01488		90	01494
	110	01489		110	01495
	125	01481		160	01496
	160	01490		200	01484
	200	01482			

3.8 POLO-KAL NG . Adapter union

**Adapter screw connection
long spigot/screw nut**



DN	A. no.
32/1"	01732
40/1 1/4"	01734
50/1 1/2"	01737

**Adapter screw connection
long spigot/external thread**



DN	A. no.
32/1"	01733
40/1 1/4"	01735
50/1 1/2"	01736

3.9 POLO-Accessories

POLO-KAL NG Chamfering tool



DN
32/40/50

Lubricant



Content
250 g tube
1000 g bucket

© Copyright. All contents and graphical representations are protected by copyright and, even in altered form, they may only be reproduced, published or distributed following the express written approval of POLOPLAST.