CONICAL PIPE STOPPERS ULK and PULK

Safety Instruction Manual

ATTENTION !!! Read these Instructions carefully before use

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1. Technical Specifications

Conical Pipe Stoppers – ULK

Type		ULK 15/40	ULK 25/60	ULK 40/100	ULK 50/120	ULK 60/140	ULK 70/160	ULK 120/220
Part-No.		1125	1120	1121	1126	1122	1123	1124
Pipeline Diameter	mm	150-400	250-600	400-1000	500-1200	600-1400	700-1600	1200-2200
Operating Pressure	bar	1	1	1	1	1	1	1
Test Pressure	bar	1,3	1,3	1,3	1,3	1,3	1,3	1,3
Sealed Back Pressure	bar	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Weight	kg	2	4,1	11	17	26	41	89

Conical Test Pipe Stoppers – PULK

Type		PULK 15/40	PULK 25/60	PULK 40/100	PULK 50/120	PULK 60/140	PULK 70/160	PULK 120/220
Part-No.		1233	1228	1229	1234	1230	1231	1232
Pipeline Diameter	mm	150-400	250-600	400-1000	500-1200	600-1400	700-1600	1200-2200
Operating Pressure	bar	1	1	1	1	1	1	1
Test Pressure	bar	1,3	1,3	1,3	1,3	1,3	1,3	1,3
Sealed Back Pressure	bar	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Weight	kg	3,7	10,5	21	26	36	52	102
Bypass		1“	2“	2,5“	2,5”	2,5“	2,5“	2,5“

Conical Pipe Stoppers – ULK

	ULK 15/40	ULK 25/60	ULK 40/100	ULK 50/120	ULK 60/140	ULK 70/160	ULK 120/220
Cylinder Length mm mm	250	300	500	570	650	780	1100
Cone Length mm	300	350	600	670	800	800	1050
Total Length mm	850	1000	1700	1910	2250	2380	3200
Face Diameter mm	80	180	350	420	500	600	800
Width of Sealing Strips mm	70	100	150	150	200	200	200
Thickness of Sealing Strips mm	10	10	15	15	15	15	15
Inflation valve	1	1	1	1	1	2	2
Metal Eye	1	1	1	1	1		
Canvas-Rubber/Metal Eye					1B	1F+1B	1F+1B

Conical Test Pipe Stoppers – PULK

	PULK 15/40	PULK 25/60	PULK 40/100	PULK 50/120	PULK 60/140	PULK 70/160	PULK 120/220
Cylinder Length mm mm	250	300	500	570	650	780	1100
Cone Length mm	300	350	600	670	800	800	1050
Total Length mm	850	1000	1700	1910	2250	2380	3200
Face Diameter mm	80	180	350	420	500	600	800
Width of Sealing Strips mm	70	100	150	150	200	200	200
Thickness of Sealing Strips mm	10	10	15	15	15	15	15
Inflation valve	1	2	2	2	2	2	2
Metal Eye		4	4	4	4		
Canvas-Rubber/Metal Eye						2F+2B	2F+2B
Bypass	1“	2“	2,5“	2,5”	2,5“	2,5“	2,5“

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2. Procedure before Use

2.1 Check the Stopper and its accessories before and after each use. The surface of the Stopper should not show any mechanical or chemical damage such as cracks, fissures, blisters, exposed textile reinforcement etc. The inflation quick coupler should not be damaged. The control unit and the connecting hose including the nipples and quick couplers must be clean and undamaged.
Remove any dirt from the surface and wash it with water and detergent after each use. Never use solvents or other aggressive cleaning substances.

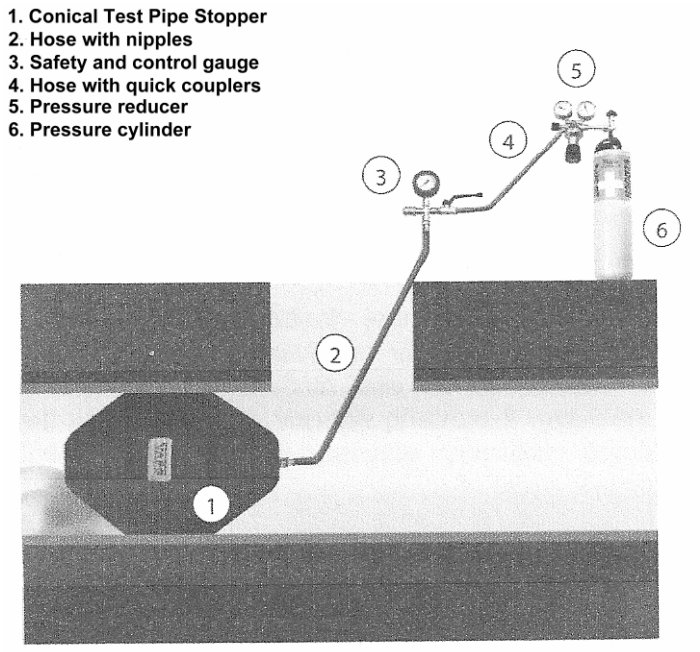
2.2 Choose the right size of the Stopper considering the diameter of the pipe. Each Stopper has been designed and is intended for pipes the diameters of which are within a certain range. Never use a stopper in a larger diameter of pipe, than that stated on the stopper.

2.2.1 Always use the control unit (safety and control gauge), the hoses and the fittings that have been approved by the manufacturer.
Check carefully the control unit including the safety valve and connecting hoses including the nipples and quick couplers. Beware of dirt in the quick couplers which may cause leakage.
It is not allowed to change the setting of the safety valve on your own.
If you find any damage to the stopper or to its accessories, please contact the manufacturer so that the manufacturer can evaluate the problem or, possibly, replace the product.

2.4 Use protective clothes and safety equipment.
When working with the VAPO Conical Pipe Stoppers, always wear protective clothes and use safety equipment such as working boots, helmet, protective goggles and gloves.

2.5 Clean the pipe before installation of the Stopper.
Before the Stopper is installed, remove mud, sand, stones and other sharp objects from the pipe as they could cause damage the Stopper. The cleaned-up area should be twice as long as the length of the Stopper itself.

3. Procedure during Use



3.1 Check the correct installation of the Stopper inside the pipe.
The Stopper should be fully inserted in the pipe, no part of it should ever protrude from the pipe.
The Stopper should always be secured against being pushed out of the pipe by back pressure. If not inserted in the pipe, the Stopper should never be inflated more than to 0.02 MPa (0.2 bar).
Never inflate the Stopper in the pipe that has not been properly cleaned.

3.2 Never exceed the operating pressure of the Stopper specified by the manufacturer.
Always inflate the Stopper to the prescribed operating pressure that is stated on each Stopper. If the Stopper is used for a longer period of time, it is recommendable to check the pressure every hour.
Correct operation of the safety and control gauge (control unit) should be checked regularly before each use. The safety valve should start to puff away at 0.11 MPa (1.1 bar).
Exceeding the prescribed operating pressure can result in destruction of the Stopper.

3.3 Never stay close to the Stopper when inflated and installed in the pipe.
Dangerous space is in front of any pipe, sewer, conduit, inlet or gulley where the Stopper is placed. Never stay in this dangerous space. Possible accident could cause a serious injury or even death.

4. Procedure when Pulling the Bag Out

4.1 Before deflating the Stopper, decrease the back pressure behind the Stopper to minimum to prevent the Stopper from being sharply pushed out from the pipe and damaged or even destroyed.

4.2 During deflation, when the pressure of the water behind the Stopper is equal to the pressure in the Stopper, the water starts flowing under the Stopper without the Stopper being loosened from the pipe. This works especially well with bigger Stoppers (e.g. (P)ULK 60/140, (P)ULK 70/160, (P)ULK 120/220). With DN 1000, the pressure difference is 0,01 MPa (0,1 bar). Caution! This procedure requires great care and a lot of experience. You should be properly trained in finding the best point for quick deflation.

4.3 When deflating the Stopper that has been installed in a small-diameter pipe, there is a danger that the Stopper can "dart out" of the pipe if not properly anchored. Being pulled out of the pipe, the Stoppers expand to their maximum diameter depending on their models. When working from the above with the worker standing out of the shaft, there is only a danger of losing the Stopper. The shaft however can be filled up with water very quickly and the lives of the persons in the shaft can be endangered in case the outlet is clogged and the flow rate is high. For that reason no persons are allowed in the shaft when handling the Stopper or when any problems occur.

4.4 Deflation of the Stoppers using the control unit (safety and control gauge) should be carried out from a safe distance from the Stopper, preferably by exhausting the air from the Stopper with an ejector or a suction pump. If you are absolutely sure that there is no pressure behind the Stopper and if you do not have any other devices to deflate the Stopper at hand, only then can you open the GEKA 1" Quick Coupler on the Stopper to speed up the deflation process. After that, pull the Stopper out of the pipe.

4.5 When fixing the working rope to the Stopper before its deflation, you should make sure that the Stopper has a sufficient space in the pipe to move. Please be aware that water pressure behind the Stopper can be extremely high. With a 1-metre-in-diameter pipe and with the water column of 5 metres, the pressure reaches approx. 39.25 kN which is equal to approx. 4 metric tons. Fixing the Stopper with a rope is impossible since the tensile strength of the large 90 mm suspension eye is lower than 10 kN = 1 mt. Therefore, it is not correct to deflate the Stopper and to want to fix it with a rope while still under water pressure. The Stopper must at all times be fixed by its internal pressure or secured with boarding otherwise the eyes would break under the strain and the Stopper would get damaged.

5. Securing the Stopper

5.1 Securing classic Test Pipe Stoppers having too small contact surface and small thrust, especially those with a metal core is absolutely essential in order to compensate adhesion. This means that the Stopper should be secured against slipping out of the pipe. You can also (and without any problems) secure the ULK and PULK Stoppers, preferably on their face surfaces, using wooden boarding.
The operating pressure should be regularly checked. Pressure drop by max. 10% per 24 hours is allowable. If necessary, the Stopper can be additionally inflated to restore the original pressure.

5.2 Tightness tests with the VAPO Conical Test Pipe Stoppers using air up to 0.02 MPa (0.2 bar) or water up to 0.05 MPa (0.5 bar) can be carried out in clean pipes with proper securing. All the related work, as a matter of course, should be carried out from the above, i.e. from the space out of the shaft. It is not allowed to enter the shaft during a tightness test. The existing pressure (or, possibly, pressure drop) should be thoroughly checked and all the values properly recorded.

6. Special Notice

6.1 Check the situation directly on the spot before each use of the Stopper. The place in the pipe where the Stopper is to be installed must be clean. Any metal points or reinforcement bars are extremely dangerous and must be removed. If they cannot be removed, a different place for installation of the Stopper must be found.

6.2 When inflating the Stopper, stay in the shaft for the shortest possible time necessary for checking its proper installation. As soon as the Stopper clings to the wall of the pipe, all the related work should be carried on from the outside of the shaft. This also applies to deflation and removal of the Stopper.

6.3 Keep the Stopper away from heat and temperatures above 60°C (140°F) or ensure its effective cooling.

6.4 Prevent the rubber for being cut, heavily scratched or exposed to strokes. Damaged Stoppers are extremely dangerous. For that reason, mark them as such immediately and have them repaired.

7. Care and Maintenance

7.1 Check the functioning of the Stopper and hoses after each use. Make sure that they have not been damaged and wash them thoroughly with hot water and soap. The quick couplers on the hoses should be checked and washed with special care. They can possibly be lightly lubricated with an acid-free lubricating grease.

7.2 To check the Stoppers, inflate them to the pressure lower than 0.001 MPa (0.01 bar) and check the surface of the Stopper carefully while washing it with water and soap. Any cuts in the rubber that go down to the fibres of the underlying fabric are very dangerous because the wall strength of the Stopper has been affected.

7.3 If any cuts are found during the check, carry out the pressure test at 0.05 MPa (0.5 bar) for the period of 15 minutes. Caution! Always see to it that no persons are close to the Stopper when carrying out this test. It is, for example, recommendable to inflate the Stopper round the (walled) corner. If the Stopper burst, its metal parts could be flung away with a great force over a long distance. These precautions are therefore absolutely essential to protect lives of bystanders.

7.4 If, in working conditions, damage to the Stopper appears, have it repaired or repair it by yourselves using the original materials and following the respective instructions. You can repair the Test Pipe Stoppers by yourselves without any problems. Nevertheless, there is a great risk of explosion of the Stopper if such a repair has been made unprofessionally. Caution! In spite of the fact that the wall of the Stopper is not made thinner by being repaired, the Stopper should not be repaired in too many places. For that reason, only one repair per each 100 mm of the diameter is allowed. Example: With the ULK 40/100 Test Pipe Stopper, maximum 10 repairs are allowed. Before repair, please check very carefully that the fabric is undamaged besides the actual damaged place. Repairs should be made by persons with expert knowledge only. Our instructions must be strictly adhered.

7.5 Check the control unit (safety and the control gauge) after each use. The safety valve has been set to 0.1 MPa (1 bar). It is not allowed to change the setting of the safety valve on your own. It is not allowed to use the Stoppers without the original accessories supplied by our company. The control unit should be tested using a suitable pressure gauge. If such a pressure gauge is not available on the spot, the control unit can be tested by comparing at least three other control units connected to one Stopper placed in the pipe. The fittings should show the same pressure within the range from 0.0 to 0.1 MPa (0 to 1 bar) and the safety valves should start to puff away at 0.011 MPa (1.1 bar).

7.6 The whole system should be thoroughly checked once a year. The test procedure is described in the previous paragraphs. Besides, the Test Pipe Stoppers should (when inserted in the pipe) be inflated to the operating pressure of 1 bar for 15 minutes. If applicable, this test should be performed in the pipe to minimize any possible risk.

7.7 The Test Pipe Stoppers and their accessories should, after a thorough inspection, be stored in a clean, cool and dry place protected from sunlight

Enclosure no. 1

Operating instruction for repair of conical pipe stoppers ULK and PULK

These pipe stoppers are easy reparable. During repair must must be ambient temperature +10°C up to +45°C and it is necessary to avoid direkt sunlight and the temperature falling below dew point. For small reparations deliver producer repair set. Reparations can make only skill persons according these operating instructions. It is allow only one repair on 10 cm of diameter pipe stoper. It means that for example on ULK 40/100 can be 10 repairs. Big repairs must be make only by producer.

Working manual:

1. At first choose right patch. For dimensions 15/40, 25/60, 40/100 one-layer patch and for dimensions 60/140, 70/160, 120/220 two - layers patch. Then apply right size. The diameter of patch must be at least three times bigger as maximal dimension of damage place.
2. Bonding surfaces must be clean and free from chemicals and oil.
3. Then buff thoroughly both surfaces and remove buffing dust.
4. Mix the required quantity of SC 2000 with UT-R20 hardener (4% of the total weight). Use the mixture within 2 hours.
5. Apply thin coats on each bonding surface. This first coat must dry completely at least 30 minutes.
6. Then apply the second coat. This coat must dry until it is slightly sticky. Check with the back of your finger. In case of overdrying apply another coat.
7. Put the bonding surface on one another, avoiding air inclusions.
8. Roll on vigorously or press on firmly.
9. Repair must dry at least 24 hours.

Enclosure no. 2

Use of Conical pipe stoppers ULK a PULK for various profiles

1. Egg – shapped pipe

Sealing cross – section width/ height	Conical pipe stopper ULK or PULK
300/450	25/60
400/600	25/60
500/750	40/100
600/900	40/100
700/1050	40/100 (50/120)
800/1200	50/120 (60/140)
900/1350	60/140
1000/1500	60/140 (70/160)
1200/1800	120/220
1400/2100	120/220

2. Square pipe

(width + height) x 2 : 3,14 + 10 % = diameter of ULK or PULK

3. Jaws pipe

Sealing cross – section width/ height	Conical pipe stopper ULK or PULK
1600/1200	70/160
1800/1350	70/160 (120/220)
2000/1500	120/220
2400/1800	120/220