



Kidde Inert Gas System.  
Product / Design Manual  
MA-01-9006-0100  
Filling 469 – Procedure, Nitrogen  
Section 12c




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Kidde Fire Protection  
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	- Kidde Inert Gas System -				Manual no.:	
	<b>Filling 469 Procedure, Nitrogen</b>				MA-01-9006-0100	
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## 1. Revision Log

Revision	Page	Description	Date
<b>11</b>	<b>All</b>	<b>For filling station</b>	<b>2015-01-02</b>

## 2. Purpose:

The purpose of these procedures is to give general guidelines for filling of a Kidde Nitrogen cylinder equipped with a high-pressure cylinder valve.


The intent is to have the highest guarantee for correct filling wherever in the World a Kidde Nitrogen cylinder is to be filled.

The filling procedures may be adjusted according to normal routines for the chosen filling station, provided the stipulated requirement's as for pressures and contents concerned are complied with.

## 3. Responsibilities

It is the responsibility of the local distributor, Agent to issue these procedures to the relevant filling stations.

It is the responsibility of the filling station to fill cylinders acct. these procedures, to refit removed thread protection caps, to fit transport protection cap, to attach filling labels, prepare filling list(s), issue letter of conformity etc.

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## 4. Kidde Nitrogen System

### 4.1 Purity of Nitrogen

Nitrogen:	$N_2$	$\geq$	99.9%:
	$O_2$	$\leq$	10 ppm
	$H_2O$	$\leq$	10 ppm

**Note:** Only principal contaminants are shown.  
Other measurements may include: CO, NO, NO<sub>2</sub>, CO<sub>2</sub>, most < 20 ppm.

## 5. General filling:

The filling process may be using pressures or weights as the means of control of the quantity of the tree gases administered.

***During the filling process, care shall be taken not to exceed the pressure nor shall the temperature limitation of the system i.e. the filling ratio be adjusted in such a way that the temperature within the cylinder never exceeds 50°C.***

The filled quantity / pressure shall be strictly in accordance with the specific requirements.

### 5.1 Gas analysis after filling.


In the event of need of preparing a gas analysis of the filled gas, sample for analysis to be taken via the gauge connection port.

See. 13.2 using relief unit described in 13.3.1

## 6. Filling Pressure Controlled

Kidde Nitrogen industrial fire protecting systems utilizing cylinder pressures at a filling reference temperature 15°C, for systems acct. NFPA 2001 the ref. filling temperature is 20 deg. C. of 150 bar, 200 bar and 300 bar.

*It has shown to be beneficial to allow for a resting period of ½ hour after filling cylinders to 150 bar until final pressure. This may especially be beneficial in warm periods.*

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### ***6.1 Filling: 150 bar nominal ref. temp. 15°C.***

The final pressure shall be verified according to a nominal pressure of 150 bar at 15° C. Acceptable minimum pressure 147 bar and maximum pressure 152 bar.

### ***6.2 Filling: 150 bar nominal ref. temp. 20°C.***

The final pressure shall be verified according to a nominal pressure of 150 bar at 20° C. Acceptable minimum pressure 147 bar and maximum pressure 152 bar.

### ***6.3 Filling: 200 bar nominal ref. temp. 15°C.***

The final pressure shall be verified according to a nominal pressure of 200 bar at 15° C. Acceptable minimum pressure 196 bar and maximum pressure 202 bar.

### ***6.4 Filling: 200 bar nominal ref. temp. 20°C.***


The final pressure shall be verified according to a nominal pressure of 200 bar at 20° C. Acceptable minimum pressure 196 bar and maximum pressure 202 bar.

### ***6.5 Filling: 300 bar nominal ref. temp. 15°C.***

The final pressure shall be verified according to a nominal pressure of 300 bar at 20° C. Acceptable minimum pressure 294 bar and maximum pressure 303 bar.

### ***6.6 Filling: 300 bar nominal ref. temp. 20°C.***

The final pressure shall be verified according to a nominal pressure of 300 bar at 20° C. Acceptable minimum pressure 294 bar and maximum pressure 303 bar.

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## 7. Filling Weight Controlled

Nitrogen shall be administered acct. the table below in order to achieve the required cylinder pressure at 15°C/20°C.


It must be noted that the net volume of the cylinder shall be used for calculating the required quantity of the individual gasses.

The final filling pressures(s) shall be verified. See Pressure – temperature relations for Kidde Nitrogen Chapter 5.

*It has shown to be beneficial to allow for a resting period of ½ hour after filling cylinders to 150 bar until final pressure. This may especially be beneficial in warm periods.*

### 7.1 Weight relations kg/l. Nominal filling's

Nominal Pressure.	Temp., °C	Nitrogen, kg/l	Kidde Nitrogen, kg/l
150 bar	15	0,174	0,174
200 bar	15	0,225	0,225
300 bar	15	0,312	0,312

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## 8. Cylinders

### 8.1 *First time filling*

Cylinders shall be new or have been pressure tested as accepted by local authorities.

Topcoat color(s) shall be in according with international requirements.

*Kidde Nitrogen cylinder: Shell, Red RAL 3001, Shoulder, Black RAL 9005*

The surface, coating, shall be undamaged.

Damaged topcoat shall be repaired acct. paint specification using compatible paint in the same color (RAL code).

Cylinders shall be clean inside, i.e. there shall be no trace of rust or iron scales inside the cylinder.

Cylinder shall be dried out prior to attachment of the valve; there shall be no trace of water inside the cylinder.

The cylinder valve thread shall be undamaged, free from any deformations and show no marks or rust

Cylinders shall have stamping as required by the authorities having jurisdiction

Size of cylinder to be filled shall be in accordance with the filling order.

Filled cylinder to be provided with a transport safety cap; a transport/filling label indication the content and the pressure and label indicating the position of the valve outlet port.

### 8.2 *Filling after a discharge*

The cylinders will after a discharge remain pressurized to approx. +1 bar and thus contain dry Kidde Nitrogen from the previous filling.


Cylinder to be pressure tested and re stamped acct. Local requirement.

The surface treatment, coating, shall be intact.

Damaged topcoat shall be repaired acct. paint specification using compatible paint in the same color (RAL code) see also above.

Service label on cylinder shall be filled out.



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## 9. Kidde valve type 01-6471-0x00

The Kidde cylinder valve is a pneumatically operated quick opening valve.

The valve is designed and suitable for use in fire extinguishing systems having a storage pressure of 300 bar fill. ref. temperature 15°C

The valve has a throughput that will allow for emptying an 80 l, cylinder pressurized to 300 bar in less than 60 sec's.

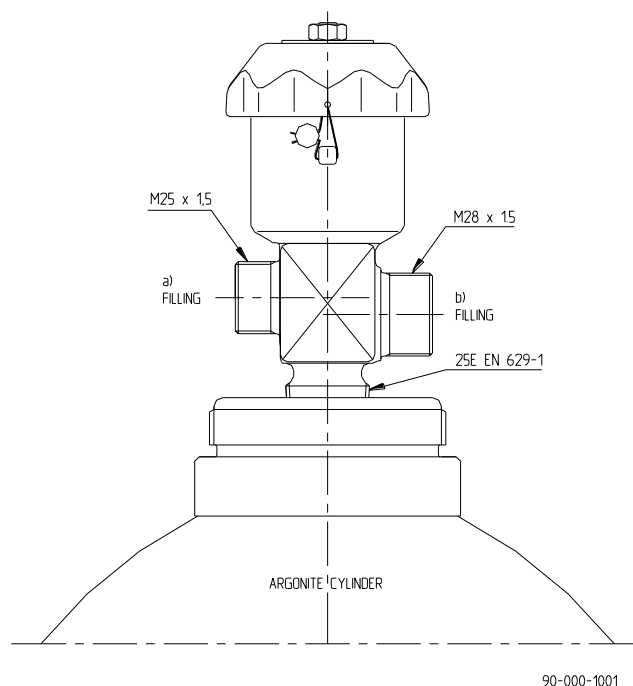
The valve is kept shut by the pressure within the cylinder.


The valve may for filling purposes be opened - closed manually by use of the hand-wheel or pneumatically by applying – removing pressure to the actuation port. The valve recommended being operated opened/closed pneumatically only.

**Note:** *Pressure - Torque required for opening/closing the valve, see 4.4.1 below.*

The handle on the valve is only intended for being able to function check the valve prior to filling and to allow for sealing off the valve after filling.

In the closed position the handle has a free turn, which allow for positioning of the holes for easy inserting the sealing thread in the hole in the handle and on the valve body.



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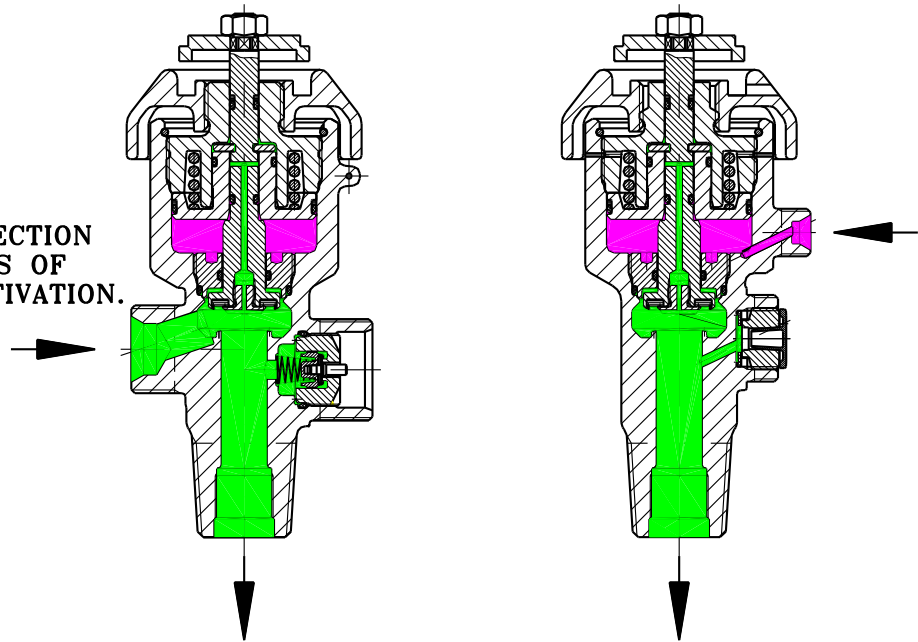
## 9.1 Principle of Filling / Evacuation of Cylinder

### 9.1.1 Filling of cylinder

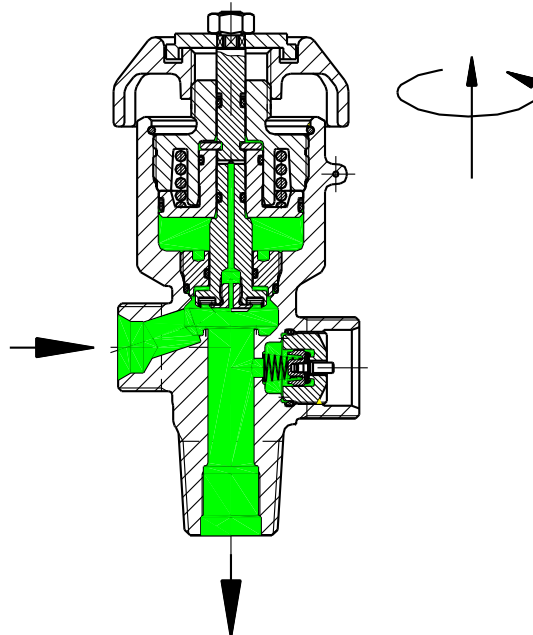
#### - FILLING OF CYLINDER -


Scale 1:2

FILLING VIA  
OUTLET CONNECTION  
AND BY MEANS OF  
PRESSURE ACTIVATION.



FILLING VIA OUTLET  
CONNECTION AND BY  
MEANS OF MANUAL  
OPENING (HANDWHEEL).

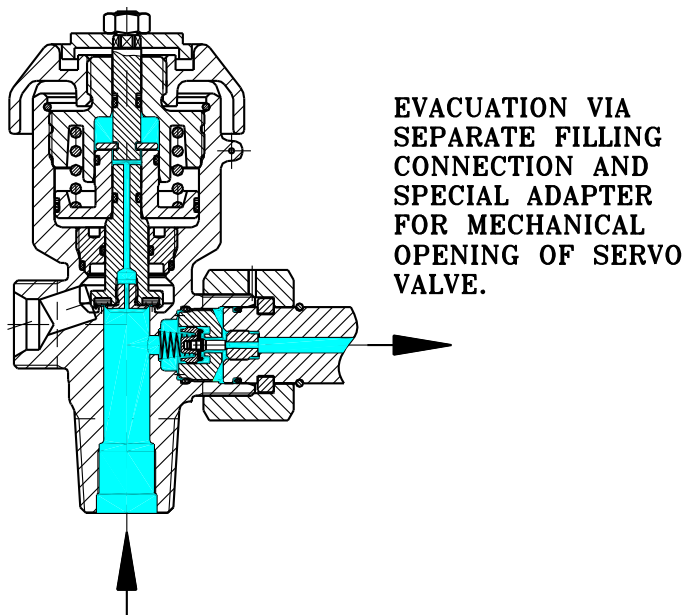


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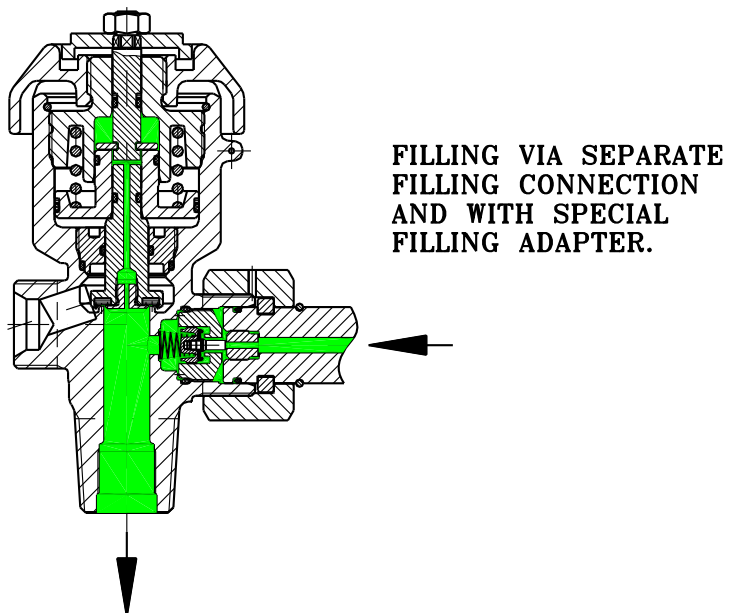
### 9.1.2 Evacuation of cylinder


#### - EVACUATION OF CYLINDER -

Scale 1:2



#### - FILLING OF CYLINDER -

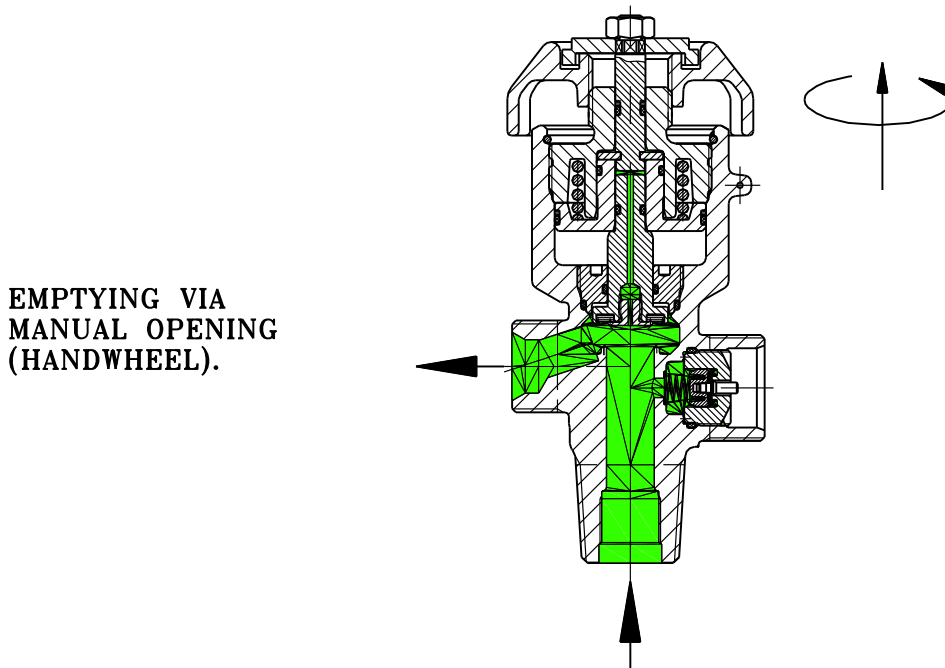
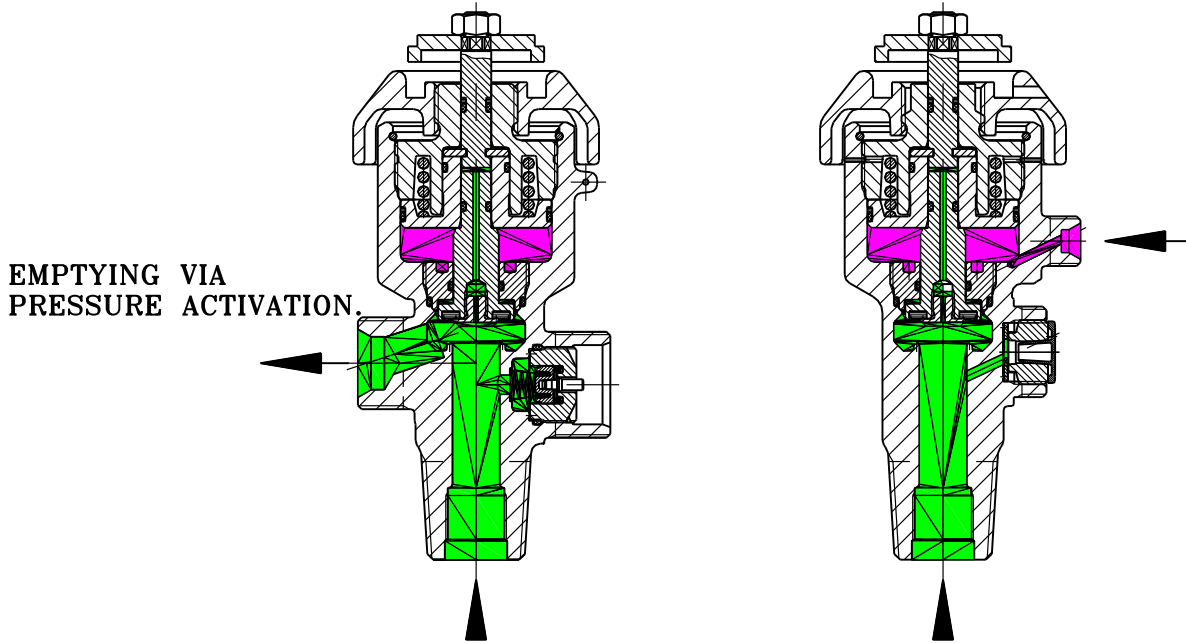



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### 9.1.3 Emptying cylinder

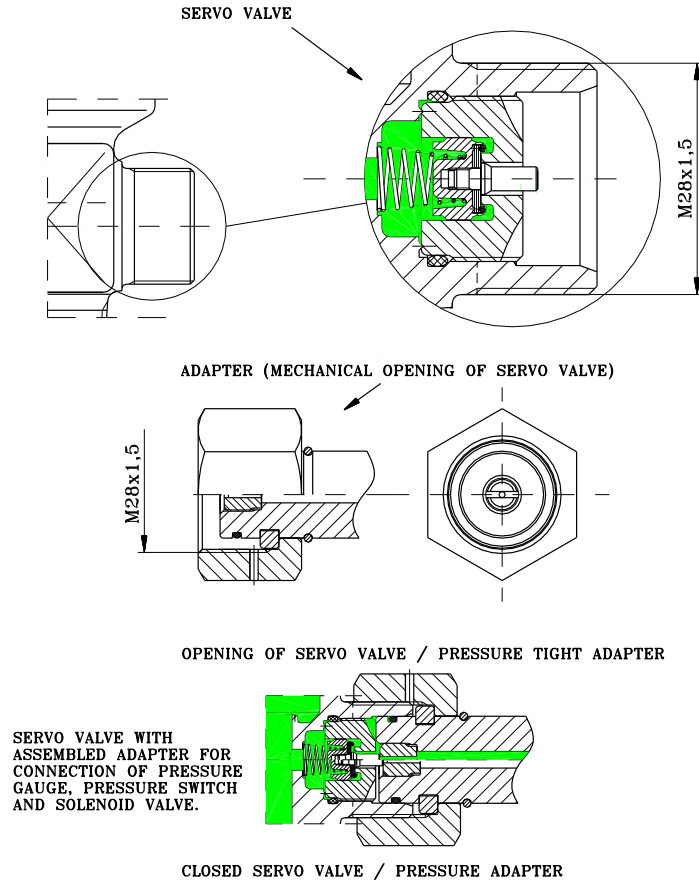
## - EMPTYING OF CYLINDER -

Scale 1:2



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### 9.1.4 Gauge port details



## 9.2 Fitting valve 01-6471-0x00


Cylinder valve 01-6471-0000, 01-6471-0150 and 01-6471-0200. See sketch above.  
The threaded valve connection, 25E EN 629-1 to be screwed into the empty, clean and dry cylinder.  
The threaded cylinder connection to be provided with 10 – 12 rounds of sealing tape.  
Quality: Grade L acct. BS 7786 (2006) or PTFE-Paktape 0,057 mm.

The tape to be applied clockwise on the taper thread in an even pattern starting 2 mm from start of the thread and ending approx. 2 mm. from end of the thread. Excess tape material to be removed after valve has been screwed into the cylinder.

Alternative to using sealing tape could be an Anaerobic thread sealant like the Swagelok "SWAK" or similar however note the sealant may need a "resting" time of approx. 24 hours before filling can take place.

The torque applied shall be between 200 Nm and 220 Nm. (DS/EN-ISO 13341).

The valve may be fitted using the special valve fitting tool part no.: 15-6471-9000

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### 9.3 Filling Valve Type 01-6471-0x00

The filling can take place through one of the following connections valve outlet (a) and gauge connection (b): See sketch above.

Prior to initiating, the filling the operation of the valve should be checked by opening/closing the valve.

Connected the chosen valve-filling inlet (see below) to the Nitrogen and Argon filling system in turn.

### 9.4 Filling through valve outlet, 01-6471-0x00

The valve outlet thread is male, M25 x 1,5

The orifice area is: 63,62 mm<sup>2</sup>

Tools: Filling adapter 01-6477-0100. See Chapter 13

Filling unit with female adapter (threaded M25 x 1,5) with a venting valve to be used i.e. pressure in supply line to be vented prior to disconnecting the filling adapter from the filling inlet.

**Note:** The valve to be opened before start of filling.


#### 9.4.1 Torque required on handle for opening/closing the valve

Pressure in cylinder, Bar	Torque Nm. open valve	Torque Nm. close valve
0	2,5	1,5
150	5,0	4,0
200	6,0	5,0
300	8,0	7,0

**Note:** Never apply a torque larger than 25 Nm to the handle opening or closing.

#### 9.4.2 Pressure required on actuation port for opening/closing the valve

Pressure in cylinder, Bar	Pressure bar to open the valve	Pressure bar to close the valve
0	5,0	0
150	5,0	0
200	5,0	0
300	5,0	0

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## **9.5 Filling through gauge connection 01-6471-0x00**

The Gauge connection thread is male, W 21,8 - 14TPI Acct. to DIN 477.  
The gauge connection has built in a piston operated “non-return” valve.  
The valve, in non-activated position seals off the outlet.

The orifice area is: 7,67 mm<sup>2</sup>.


Tool: Filling adapter 01-6477-0000 see Chapter 13.

Filling valve with female adapter (threaded W 21,8 - 14TPI Acct. to DIN 477) see below, with a venting valve to be used i.e. pressure in supply line to be vented prior to disconnecting the filling adapter from the filling inlet.

O-ring in adapter to be lubricated using: Würth silicone spray, Würth Art no.: 0893221 or similar.

**Note:** *The filling flow to be gradually increased i.e. the filling to be initiated at a low flow rate and only after a counter pressure of approx. 50 bar be increased to full capacity of the supply line. It is recommended that a filling adapter type: 01-6477-0000 is used. At the beginning of pressure build up in the cylinder a hiss from the venting chamber in the valve may be heard. If the venting continues at approx. 100 bar the filling shall be stopped and the valve inspected.*

*It has shown to be beneficial to allow for a resting period of ½ hour between the two fillings in order to let the cylinders cool down. This has especially been beneficial in warm periods.*

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## 9.6 Check list filling through outlet port

Step	Description	Check.	Comments
1	List the cylinder number on filling list.		(See sample attached)
2	Ensure correct color coding of cylinder		Shoulder Black
3	Ensure attachment of Teflon tape on the cylinder thread on the valve is intact before the valve is screwed into the cylinder. Torque 200 - 220 Nm.		
4	Remove the plast protection cap from the filling inlet. (outlet port)		
5	Check function of valve, open and close by using the hand-wheel on top of valve.		
6	The valve shall be fully open during filling. Open the valve by turning the hand-wheel clockwise until resistance is felt.		
7	Fill the Nitrogen, to the required pressure or against table in Chapter 2 if weight related.		
8	When filling is completed. Close the valve by turning handle anti-clockwise until handle runs free. Check the Kidde Nitrogen pressure against table in Chapter 5, when temperature equalized.		
9	Leak test all connection ports: Burst disc, outlet port, gauge port, actuation port, valve connection to cylinder, vent hole, <b>No leaks shall be accepted from any port.</b>		
10	Seal off valve, use hole in hand-wheel and eye on valve body.		
11	Refit thread protection cap on the valve outlet.		
12	Fit label "Valve outlet" on shoulder		Label at outlet port.
13	Grease thread for transport cap		
14	Fit cylinder with transport cap.		EN-ISO11117
15	Attach label "filled " as required. *		UN no.: 1066
16	Secure cylinder in transport cage or on pallets.		
17	Ship to Receiver/Site as agreed		
18	Issue filling list		
19	Issue letter of conformity to the procurer.		

\*Label 01-2141-0300, 150 bar, Yellow. \*Label 01-2142-0300, 200 bar, Blue

\*Label 01-2143-0300, 300 bar, Grey




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## 9.7 Check list filling through gauge connection port

Step	Description	Check.	Comments
1	List the cylinder number on filling list.		(See sample attached)
2	Ensure correct color coding of cylinder		Shoulder Black
3	Ensure attachment of Teflon tape on the cylinder thread on the valve is intact before the valve is screwed into the cylinder. Torque 200 - 220 Nm.		
4	Remove the plast protection cap from the filling inlet. (Gauge connection port)		
5	Check function of valve, open and close by using the hand-wheel on top of valve.		
6	The valve shall remain closed during filling. Ensure closed position by turning the hand-wheel anti-clockwise until handle runs free.		
7	Fill the Nitrogen, to the required weight, see table Chapter 2.		
8	When filling is completed. Close the valve by turning handle anti-clockwise until handle runs free. Check the Kidde Nitrogen pressure against table in Chapter 5, when temperature is equalized.		
9	Leak test all connection ports: Burst disc, outlet port, gauge port, actuation port, valve connection to cylinder, vent hole, <b>No leaks shall be accepted from any port..</b>		
10	Refit thread protection cap on the gauge connection port.		
11	Seal off valve, use hole in hand-wheel and eye on valve body.		.
12	Fit label "Valve outlet" on shoulder		Label at outlet port.
13	Grease thread for transport cap		
14	Fit cylinder with transport cap.		EN-ISO11117
15	Attach label "filled " as required. *		UN no.: 1066
16	Secure cylinder in transport cage or on pallets.		
17	Ship to Receiver/Site as agreed		
18	Issue filling list		
19	Issue letter of conformity to the procurer.		

\*Label 01-2141-0300, 150 bar, Yellow.\*Label 01-2142-0300, 200 bar, Blue

\*Label 01-2143-0300, 300 bar, Grey

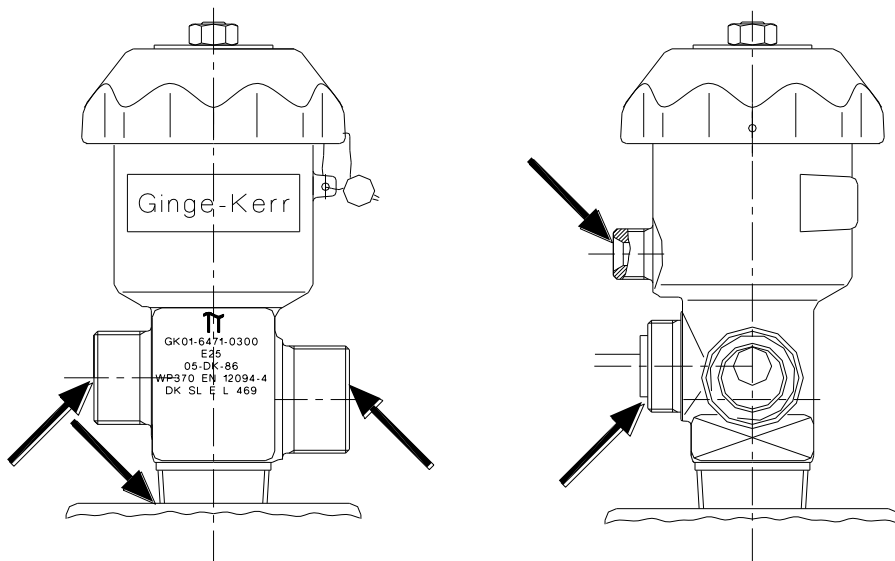
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### 9.7.1 Locations requiring leak testing

It is recommended especially at refill that an intermediate leak test is performed when the pressure within the cylinder has reached 20 – 50 bar as well as after final pressure has been reached. No leaks shall be present at either tests.


The arrows on the sketch below indicate locations to be applied with leak detection liquid in order to verify that no leak is present.

Should a leak be present, the pressure to be relieved from the cylinder and the valve refurbishment (see below) and the cylinder refilled,



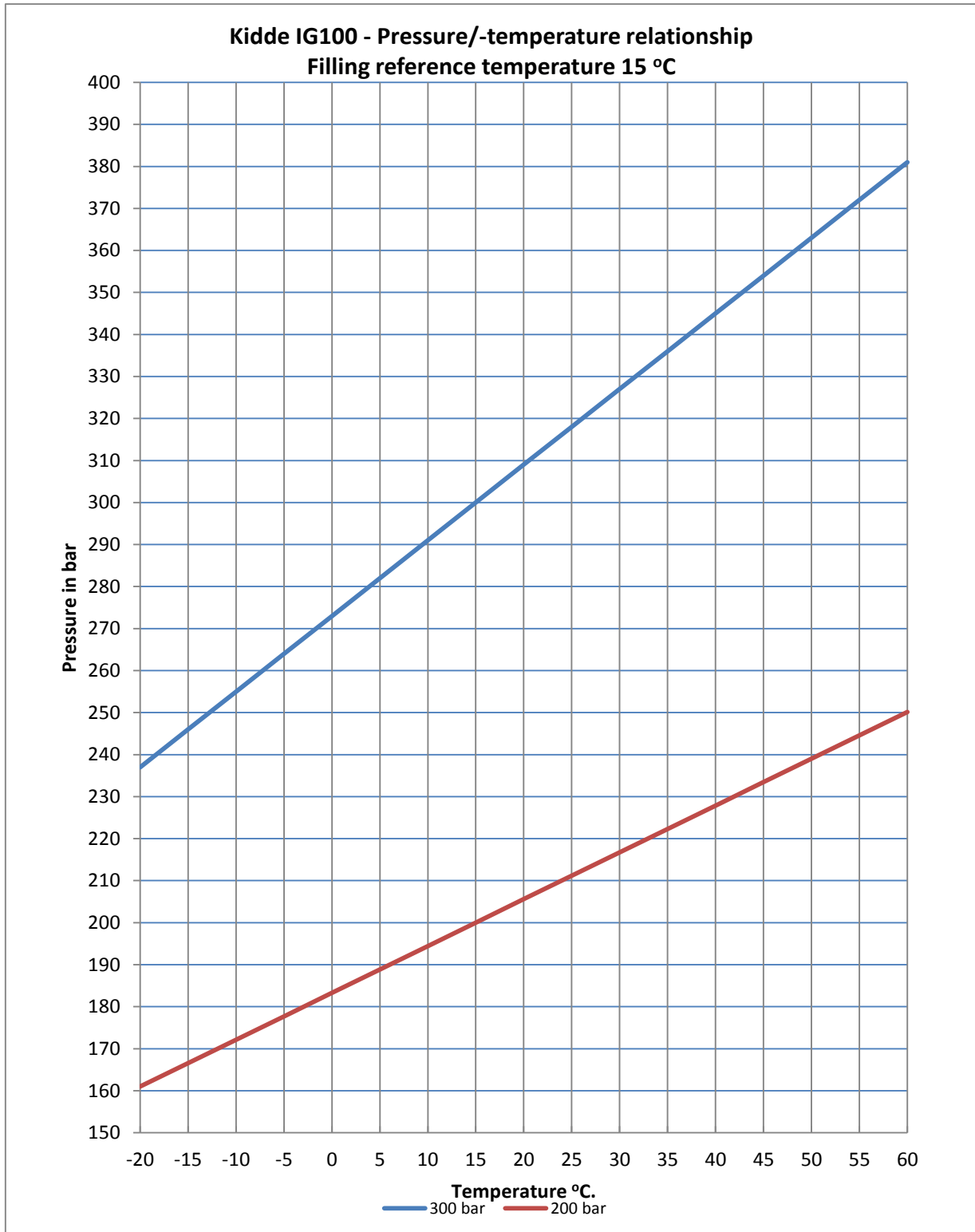
**LEAK TEST**

90-000-1175


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## 10. Temperature – Pressure relation

Based on ideal gas equation corrected for compression factors, filling temperature 15 °C. The graph is only valid after the temperature is equalized between the gas and the cylinder.





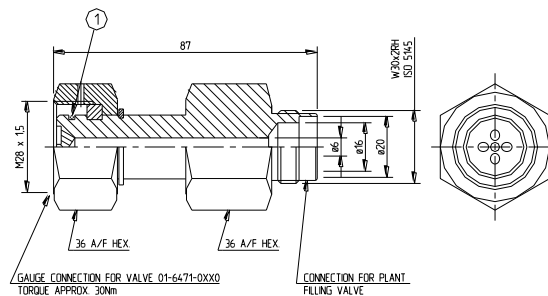
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## 12. Tools for filling

The filling adapters to be provided with a filling valve (Filling station specific).  
 After completed filling the filling valve to be closed and the filling adapter loosened slowly.  
 It shall be noted that when the chamber in the valve is vented a high noise will be heard as gas is suddenly vented through the vent hole.

### 12.1 Filling adapter, gauge connection port:

Part no. 01-6477-0000 max. 300 bar



It is recommended to lubricate the inlet opening of the valve before attachment of the filling adapter in order to prolong the life time of the sealing O'ring.

The O'ring will after repeatable use be worn out and shall be replaced.

Spare O'ring Kidde-Danmark A/S Part no.: 15-0181-0300

Dim. ID Ø17, 17 x 1,78

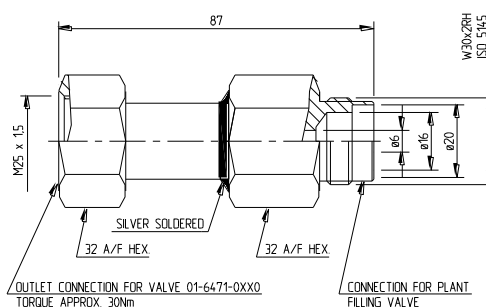
EPDM (DIM/ISO – 1629)


Shore 90 (A) +/- 5°

Lubrication: Würth silicone spray, Würth Art no.: 0893221 or similar

### 12.2 Filling adapter, valve outlet port

Part no.: 01-6477-0100 max. 300 bar.



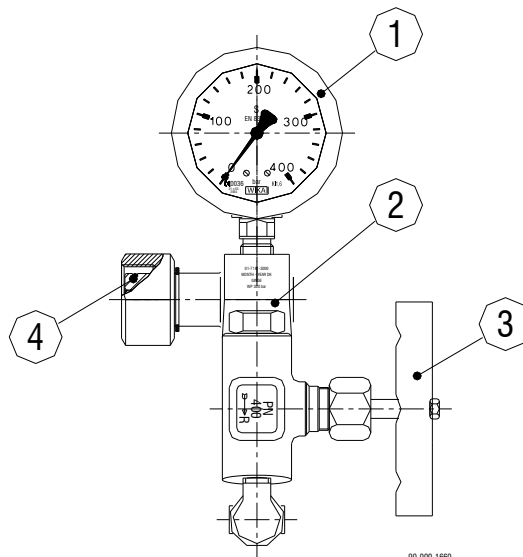
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## 13. Evacuate excess pressure

In order to safeguard the valve as much as possible from influence of vibration decomposition “cavitation” relief of pressure only to be performed via the gauge connection port, activation of the shredder valve.

### 13.1 Unit for release of pressure through the gauge port.

Part no.: 01-6475-0100




#### 13.1.1 Before attachment to the valve

Ensure that the O’ring in swivel pos. (4) is intact and lubricated. Lubricant such as Würth silicone spray, Würth Art no.: 0893221 or similar. Ensure that the needle valve pos. (3) is in closed.

Attach the unit to the cylinder valve gauge port, tighten the swivel pos. (4) NV-36 until pressure is indicated on the gauge pos. (1). Excess pressure, temperature dependent to be relieved by opening the needle valve pos. (3) until correct pressure is achieved.

When correct pressure is achieved close the needle valve and remove the unit from the cylinder valve.

Note a hiss will be heard when the chamber in the cylinder valve is vented through the vent hole in the swivel.

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## 14 Transport - Movement

### 14.1 Label on cylinder

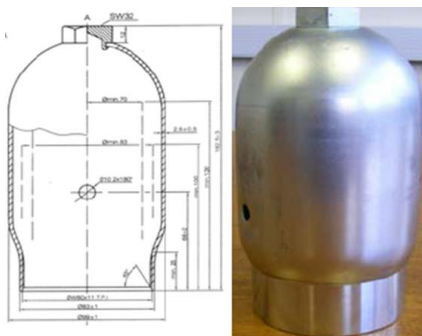
Acct. Transport regulations ADR/RID etc. all pressurized cylinders shall be provided with a label indicating at least the content and the pressure. The below labels are specifically important to have on after first filling. For transport of cylinders refilled the normal service label may be sufficient.



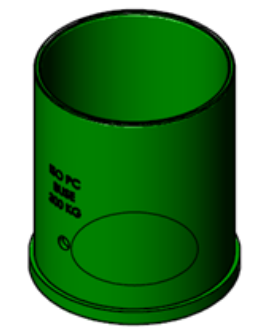
### 14.2 Transport cap/Valve guard

**Before moving the cylinders from the filling rig a proper safety transport cap/valve guard shall be fitted over the valve. The transport cap/valve guard shall meet the requirements of EN-ISO 11117.**


**The max. load the cap can withstand shall have been engraved on the used transport cap. The Kidde Argonite cylinders are all supplied with a standard transport cap meeting the requirements.**



**Typical transport cap. 15-9604-0011  
Max. 140 kgs, 80 l cylinder**



**Typical transport cap. 15-9604-0014  
Max. 300 kgs, 140 l cylinder**

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## 15 Repair of valve(s)

As the Kidde cylinder valve contains rubber O'rings and rubber seats, which over the years may harden, or otherwise become damaged, it shall therefore be recommended that cylinder valves at a minimum each 10 year be refurbished with new O'rings and seats.

The refurbishing is recommended done at the same time as the cylinders are re-pressurized as required by the authorities having jurisdiction.

***The described repairs below shall only be performed at a filling station and only by trained and certified technicians and parts used for replaced only as specified. Internal parts only available to certified filling stations and certified repair shops.***

### 15.1 Repair of cylinder valve, type: 01-6471-0xx0

#### 15.1.1 Recommended special tools


01-9671-0000      Hexagon spanner for servo valve  
Torx 40 key for burst disc units  
Fixed spanner NV 17  
Lubrication:      Silicone spray, Wurth Art no.: 0893221 or similar

#### 15.1.2 Recommended replacement parts

15-6471-0110      Servo valve unit kit.  
01-6431-0000,      Burst disc unit, 150 bar filling, "Outside hexagon"  
15-6471-0150,      Burst disc unit, 150 bar filling, "Torx type"  
01-6432-0000,      Burst disc unit, 200 bar filling "Outside hexagon"  
15-6471-0200,      Burst disc unit, 200 bar filling, "Torx type"  
01-6435-0000,      Burst disc unit, 300 bar filling "Outside hexagon"  
15-6471-0300,      Burst disc unit, 300 bar filling, "Torx type"  
15-8653-1507      Cu-Gasket ø15, 4 x 7 x 1 mm  
01-6490-0020      Silicone spray, Wurth Art no.: 0893221 or similar

**Note:** *When applying lubricant to any surface or object always ensure that the lubricant, the surface, the parts and the tools used are clean and free from impurities.*



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### **15.1.3 Burst disc units**

Should for any reason the burst disc have been blown or leakage found the following shall be performed for replacement.

Cylinder to be secured in brackets and the handle on the valve in fully open position before replacement of the unit is initiated.

The blown unit to be removed from the valve, use fixed spanner NV17 for “Old type” burst disc unit or Torx 40 key for “new type” burst disc unit.

Remove “old” Cu-washer

Clean the seat for any impurities by the use of compressed air.

Grease Cu-washer and insert in socket.

Fit new burst disc unit, secure by the use of fixed spanner, see further next page.

**Only new original parts shall be refitted.**

#### **150 bar filling**

Part no. 01-6431-0000, “Old type”, Gasket ø15, 4 x 7 x 1 mm: part no.:15-8653-1507

Part no. 15-6471-0150, “New type”, Gasket ø15, 4 x 7 x 1 mm: part no.:15-8653-1507

#### **200 bar filling:**


Part no. 01-6432-0000, “Old type”, Gasket ø15, 4 x 7 x 1 mm: part no. 15-8653-1507

Part no. 15-6471-0200, “New type”, Gasket ø15, 4 x 7 x 1 mm: part no.:15-8653-1507

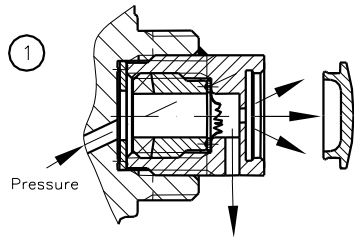
#### **300 bar filling:**

Part no. 01-6435-0000, “Old type”, Gasket ø15, 4 x 7 x 1 mm: part no. 15-8653-1507

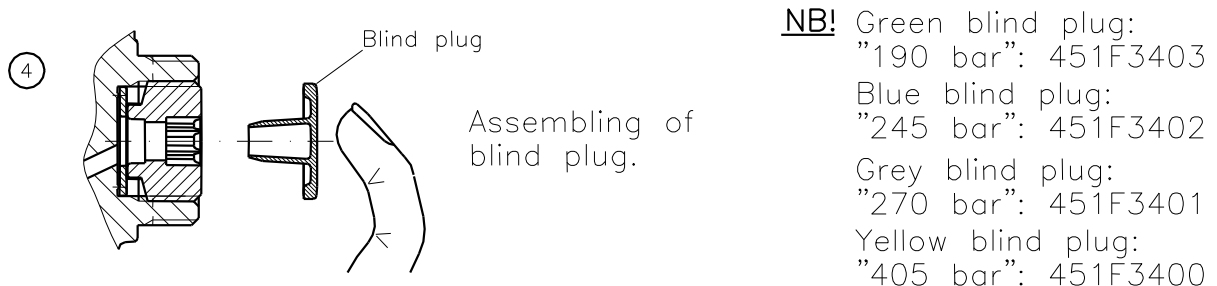
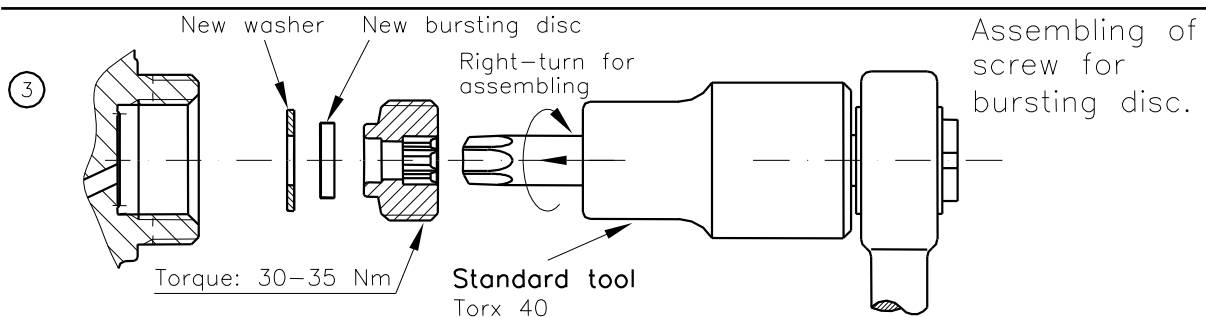
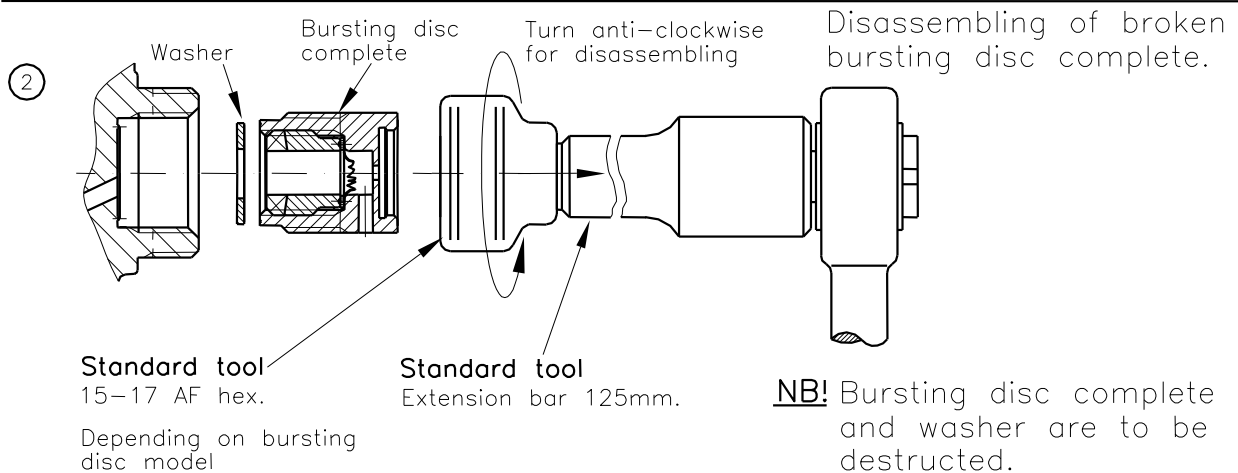
Part no. 15-6471-0300, “New type”, Gasket ø15, 4 x 7 x 1 mm: part no.:15-8653-1507

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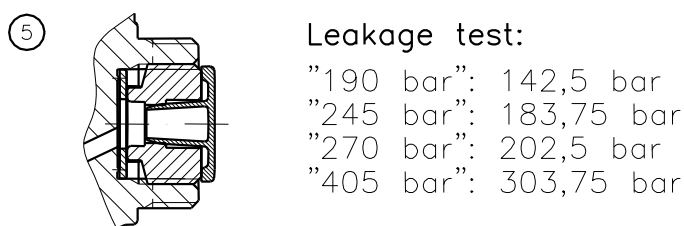
### 15.1.4 Replacing burst disc unit




Valve with broken bursting disc and blown off blind plug.



Valve with replaced bursting disc.



**NB!** To obtain tightness at the above mentioned requires that the parts are totally free of burrs.

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### 15.1.5 **Replace Servo valve, Gauge port**

Should for any reason the piston valve in the gauge port be malfunctioning/leaking the following shall be performed for replacement.

**Cylinder always to be without pressure!!!!.**

**Cylinder to be secured in brackets and the handle on the valve in fully open position before replacement of the unit is initiated.**

Replacement tool 01-9671-0000 shall always be used in order to insure proper removal as well as correct tightening the new unit.

**Only new parts to be refitted.**

**O'ring shall always be lubricated before inserted.**

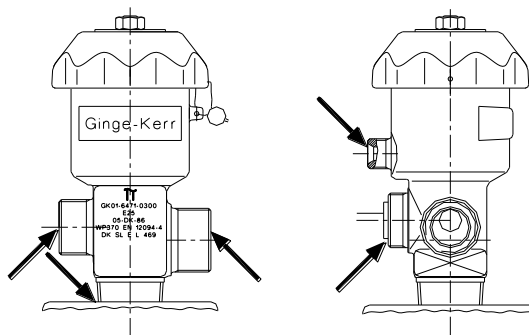
Tool: Part no.: 01-9671-0000

Piston unit kit. Part no.: 15-6471-0110

### 15.1.6 **Testing**

After refurbishing, all ports etc. shall be tested against leaks.

Pressurize the valve and leak test using as a minimum liquid leak detection, **no leaks shall be allowed.** See below



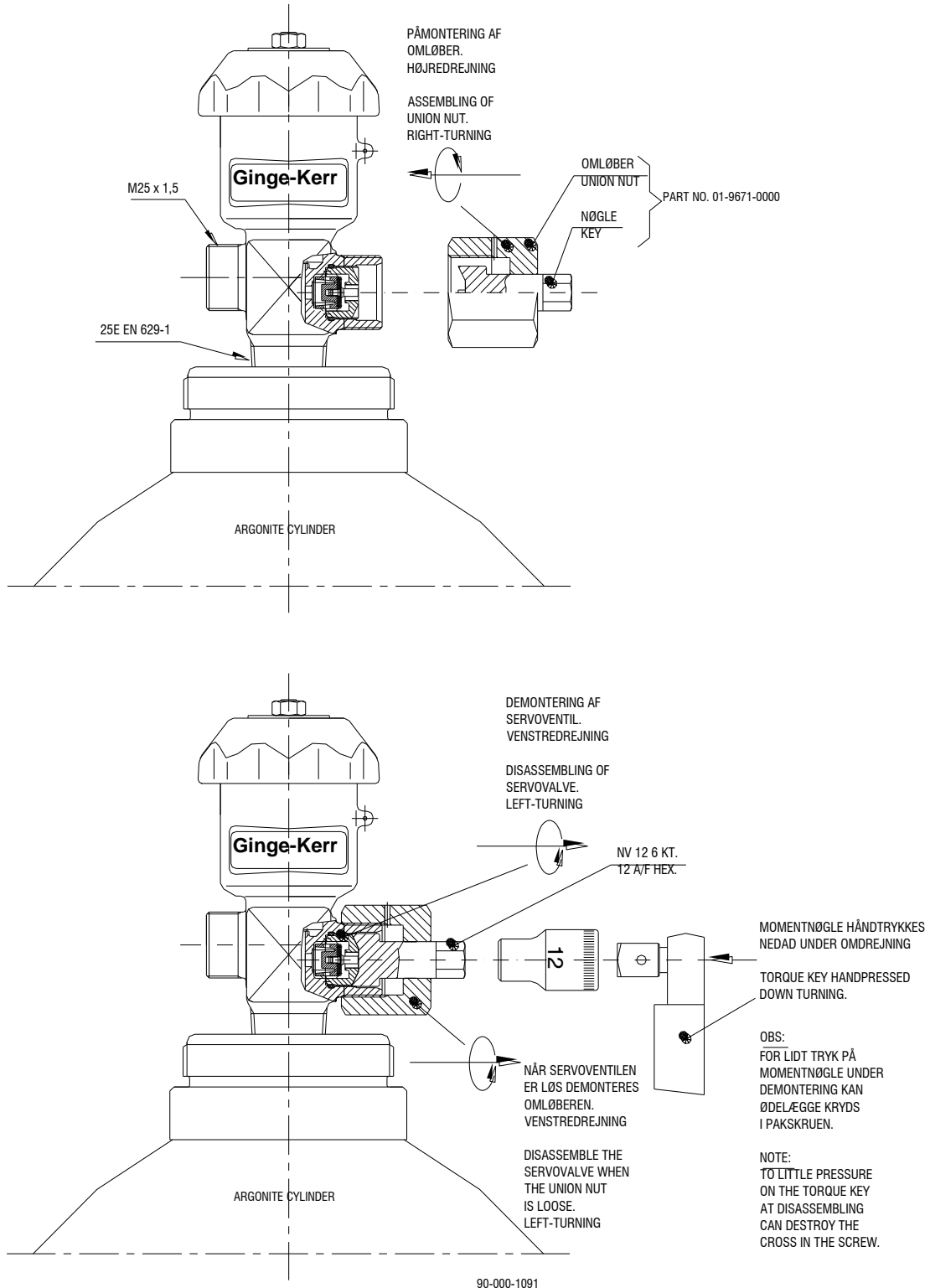
LEAK TEST


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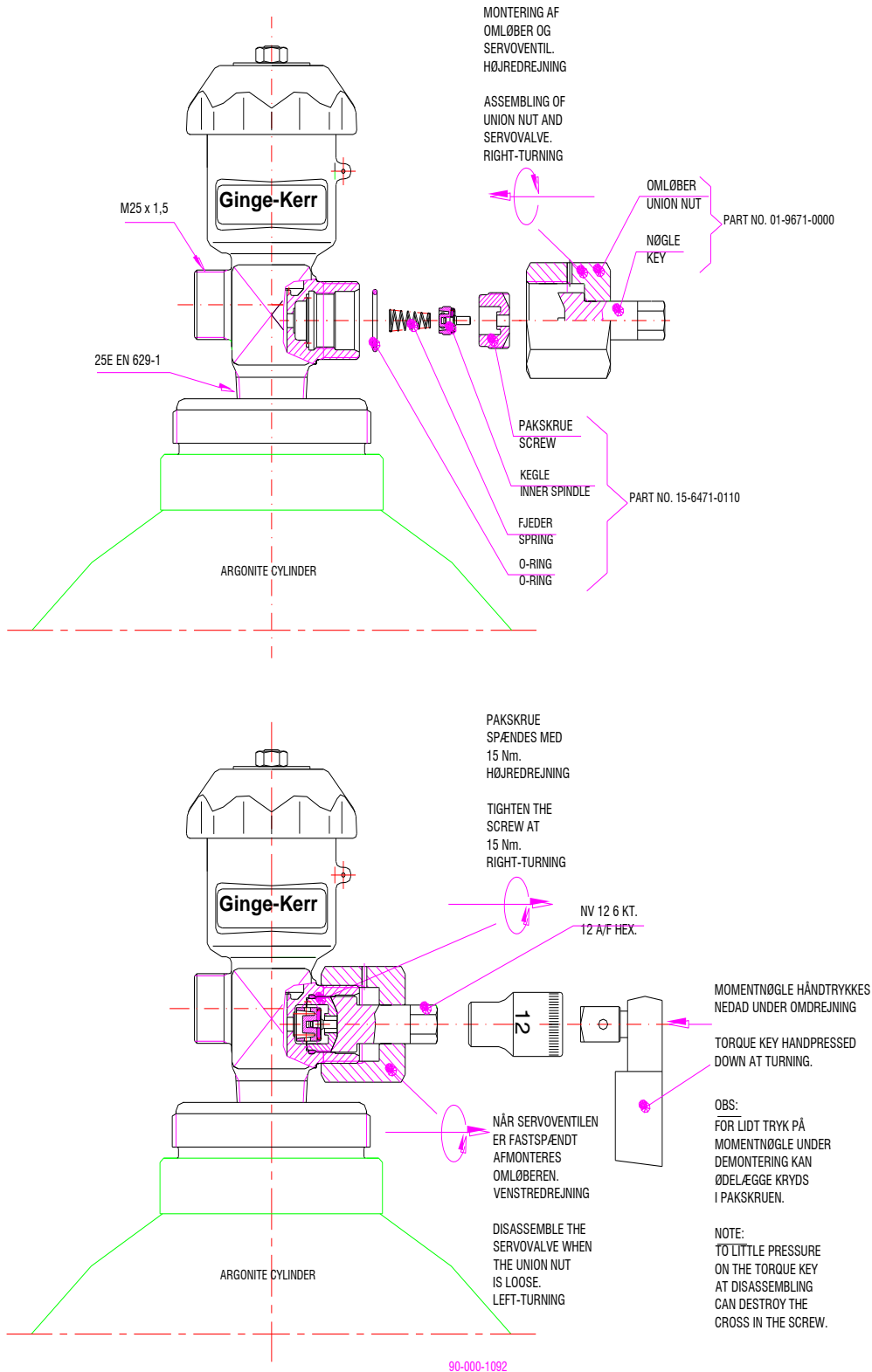
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## 15.1.7 Disassembling of servo valve 01-6471-0xx0



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### 15.1.8 Fitting servo valve 01-6471-0xx0



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### 15.1.9 **Testing detached valve for leakages**

Leakage can be detected by the appearance of bubbles at the valve top, the outlet, the bursting disk, the servo valve and at the activation connection by immersion in demineralized water, ISO propyl alcohol or by the use of approved leakage spray for brass.

NB: Immediately upon completion of the test, all the demineralized water, ISO propyl alcohol or leakage spray should be removed from the valve.

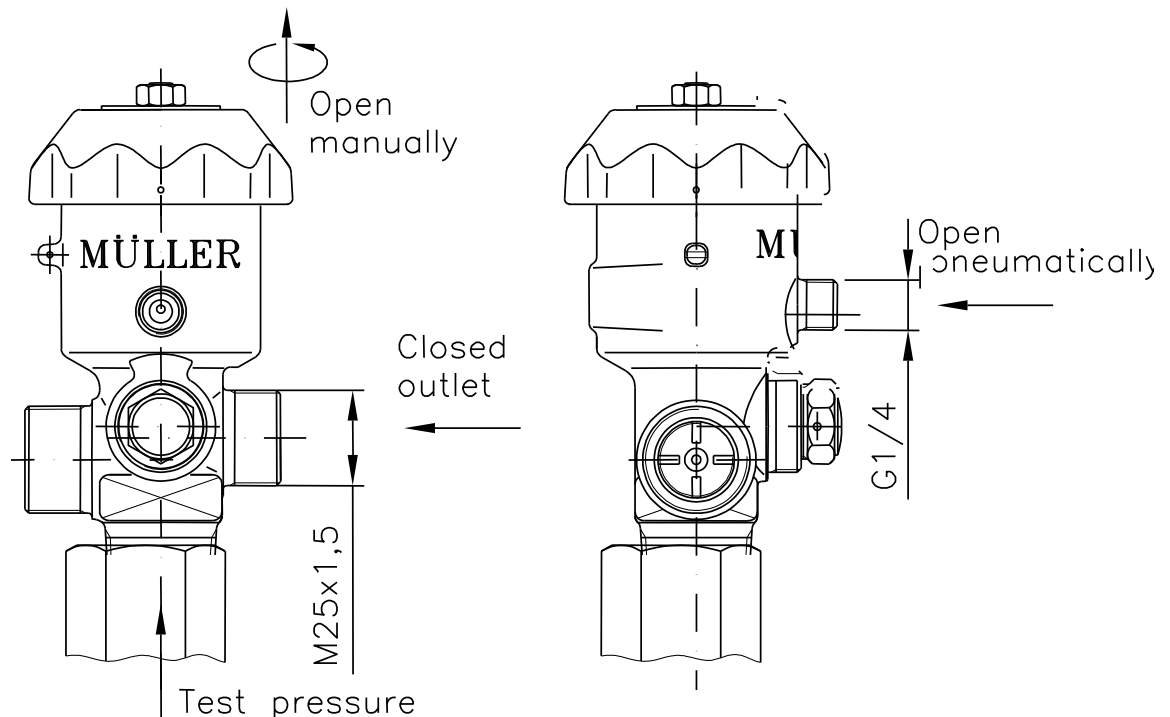
Test pressure: 20 bar – 1,2 x working pressure at 20°C and 1013 mbar.


Tightness at open valve with a pressure from the cylinder side and closed outlet (manually opened):

Leakage can be detected by the appearance of bubbles as the above by immersion in demineralized water, ISO propyl alcohol or by the use of approved leakage spray for brass.

NB: Immediately upon completion of the test, all the demineralized water, ISO propyl alcohol or leakage spray must be removed from the valve.

Test pressure: 20 bar – 1,2 x working pressure at 20°C and 1013 mbar.



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### 15.1.10 Testing function of detached valve

Test of function by applying a pressure from the cylinder side and manually (by handwheel) opened valve:

The function of the valve should be tested by a flow through the outlet.

NB: Note that the valve should be firmly secured during this test due to the risk of a large flow under a high pressure. Furthermore the outlet should point away from persons.

Test pressure: 20 bar

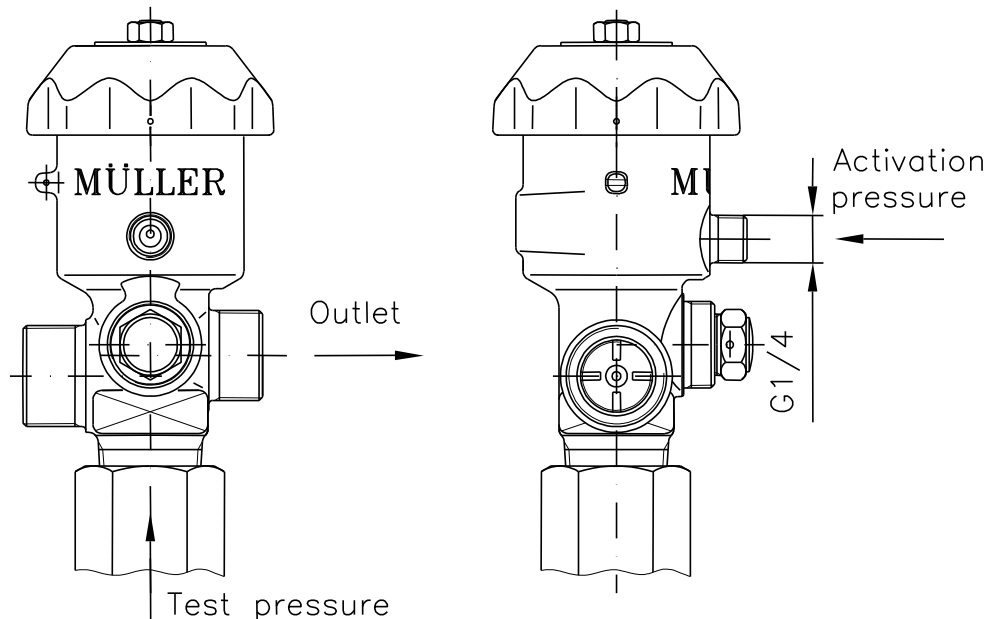
Test of function by a pressure from the cylinder side and pneumatically (by the G1/4 connection) opened valve:

The function of the valve should be tested by a flow through the outlet.

NB: Note that the valve should be firmly secured during this test due to the risk of a large flow under a high pressure. Furthermore the outlet should point away from persons.

Test pressure: 20 bar – Activation pressure: About 3 bar

See 1:



NB: This description of the test of leakage and function is no manufacturing test, but is only applicable in the field, and MGE gives no guarantee for tightness and correct function. The valve must be supplied with a marking that indicates who made the test of leakage and function, and the date.