



Level



Pressure



Flow



Temperature

Liquid  
Analysis

Registration

Systems  
Components

Services



Solutions

## Installation Instructions

# Proline t-mass 65I

### Hot tap

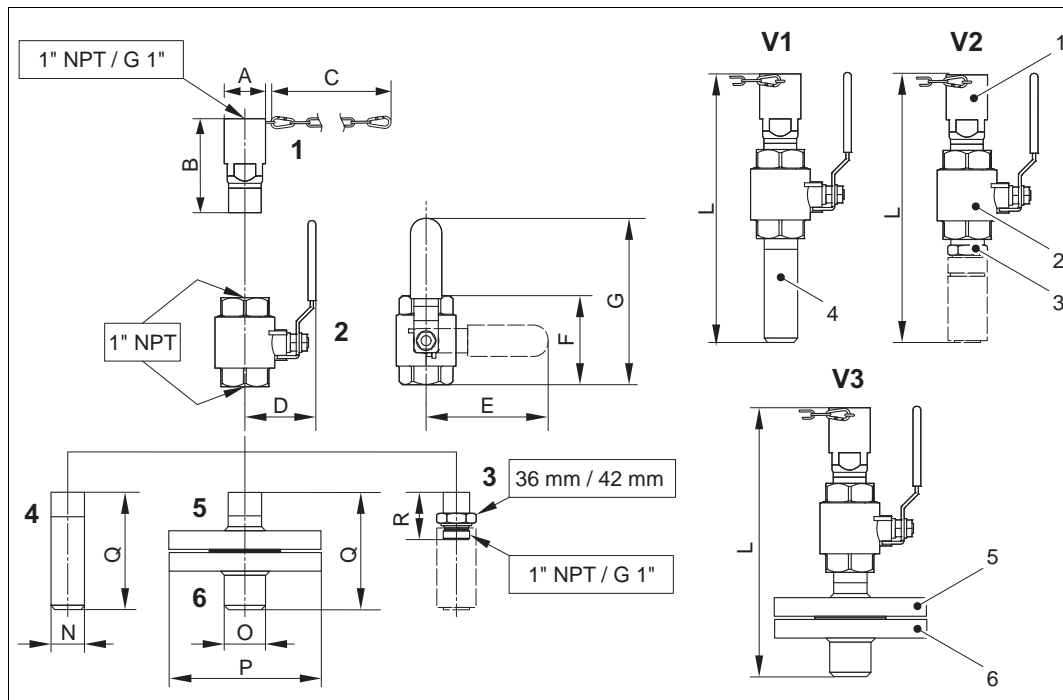
EA00086D/06/EN/06.10  
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These instructions apply to the following accessory kits:

Order Number	Original accessory kit	Page
DK6HT-1, DK6HT-2	Mounting set with ball valve and safety chain. Insertion or extraction assembly of sensor under process pressure (max. 4.5 bar, 65 psi).	1
DK6HT-3, DK6HT-4	Mounting set with ball valve and extraction assembly. Insertion or extraction of sensor under process pressure (max. 16 bar, 235 psi).	4

## Low pressure version

### 1 Dimensions



- 1 Sensor connection with safety chain
- 2 Ball valve
- 3 Retrofit adapter
- 4 Weld-in nipple (process connection)
- 5 Flange adapter
- 6 Flange (process connection)

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	A	B	C	D	E	F	G	L	N	O	P	Q	R	Weight in [kg] ([lbs])		
[mm]	42.4	96	620	71	165	88	209	~249.5	33.4	33.4	123.9	105.5	61	<b>V1</b>	<b>V2</b>	<b>V3</b>
[inch]	1.67	3.78	24.4	2.80	6.50	3.46	8.23	~9.82	1.31	1.31	4.88	4.15	2.40	1.8 (4.0)	4.3 (9.5)	2.2 (4.9)

### Tool List

36, 40, 42 mm	3 mm	Torque wrench (4 Nm)	Seal material for NPT/BSP pipe thread
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### 2 Safety Instructions

- Comply with national regulations governing mounting, electrical installation, commissioning, maintenance and repair procedures.
- Requirements with regard to specialized technical staff for the mounting, electrical installation, commissioning, maintenance and repair of the measuring devices:
  - trained in instrument safety
  - familiar with the individual operation conditions of the devices
  - for Ex-certified measuring devices: also trained in explosion protection
- Use genuine parts from Endress+Hauser only.
- If you have any questions, contact your E+H service organization.
- Modifications of the equipment are not permitted.
- Follow the Operating Instructions for the device.
- Only open housing for a brief period. Avoid the penetration of foreign bodies, moisture or contaminants.
- Before removing the device: set the process in a safe condition.
- Hot surfaces! Risk of injury! Before commencing work, allow the system and measuring device to cool down to a touchable temperature.
- Wear protective gloves and eye protection.
- The measuring device is energized. Danger: Risk of electric shock! Open the measuring device in a de-energized state only.
- In the case of installation in safety-related applications in accordance with IEC 61508 or IEC 61511: After repair, recommission in accordance with Operating Instructions. Document the repair procedure.

- Replace defective seals/gaskets with genuine parts from Endress+Hauser only.
- If threads are damaged or defective, the measuring device must be repaired.
- If threads are damaged or defective on mounting set parts they must be repaired.
- The Hot tap is permitted for use only with non-toxic, innocuous gases classified as "Group II" in accordance with the European directive 67/548/EWG art. 2.

**3 Special Safety Instructions**

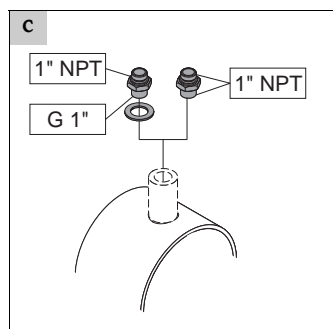
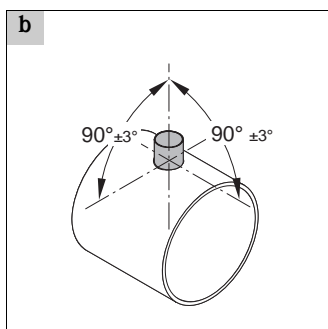
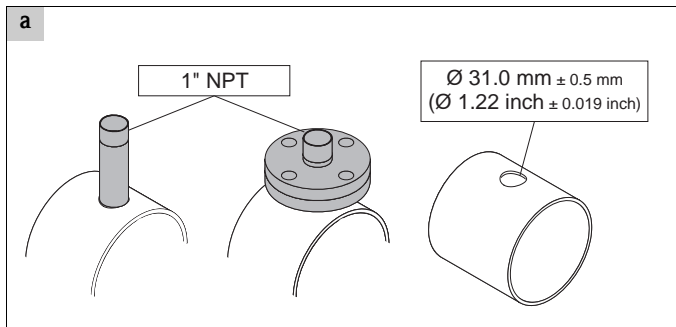
- Before inserting or removing the t-mass 65I: Make sure that the process pressure is lower than 4.5 barg (65 psi).
- When operating at continuous operating pressure: Make sure that the safety chain is always properly connected to the hot-tap and sensor fastening points.
- The pipe union must be tightened manually before the valve is opened.
- When removing the t-mass 65I: Before releasing the compression fitting, ensure that the safety chain is properly connected to the hot-tap and sensor fastening points.
- When installing the weld-in nipples, pay attention to the safety and installation instructions in the operating manual.
- Check the welding seams and screw connections for leaks.
- NPT/BSP pipe thread: use suitable seal material.

**4 Mounting the weld-in nipple or the adapter**

**Caution!**  
When installing the weld-in nipples, pay attention to the safety and installation instructions in the operating manual.

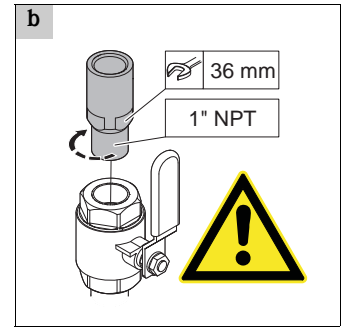
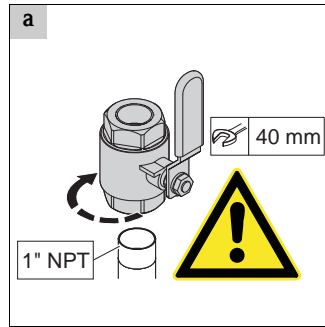
- **a:** Process connection for weld-in nipple and flange: drill or cut hole to diameter.
- **b:** Align process connection correctly.
- **c:** For existing mounting boss (DK6MB-...), a retrofit adapter can be used.

Material (process connection): 1.4404 according to EN 10272 and 316/316L according to A479

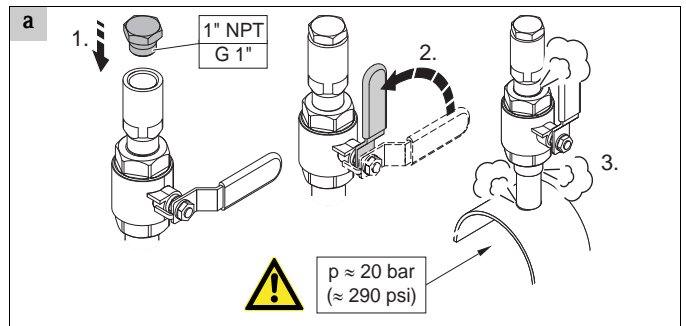


**5 Mounting of the ball valve**

**Caution!**  
Danger of leaks! Use a suitable seal material.



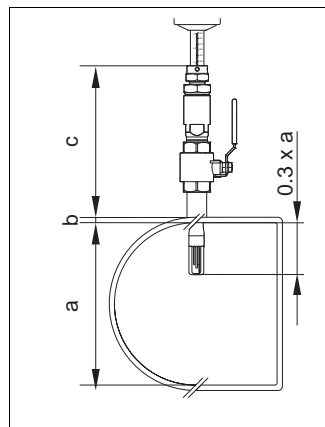
**6 Leak-proof check**



**7 Selecting the length of the insertion sensor**

For detailed information on the choice of the length of the insertion version and the ranges of adjustment, please contact your Endress+Hauser service organization.

**8 Calculate the insertion depth**

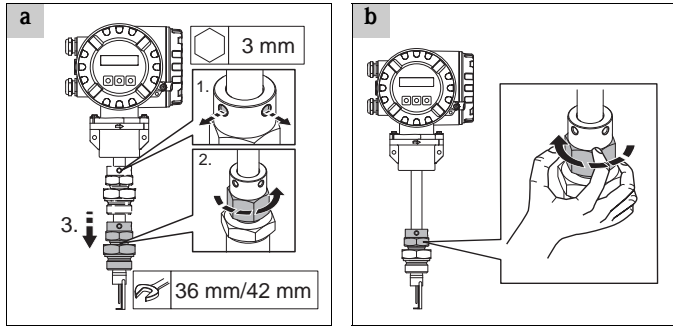


a = Internal diameter for round pipes. Duct height for a duct if the sensor is to be installed vertically, or the duct width, if it is to be installed horizontally. (a = min. 80 mm or 3 inch).  
b = Thickness of the pipe wall or duct wall

c = Depth of the welding nozzle at the pipe or duct including the sensor pipe union and Hot tap mounting set.  
Calculated insertion depth:  
Insertion depth = (0.3 × a) + b + c + 2 mm  
(Insertion depth = (0.3 × a) + b + c + 0.079 inch)

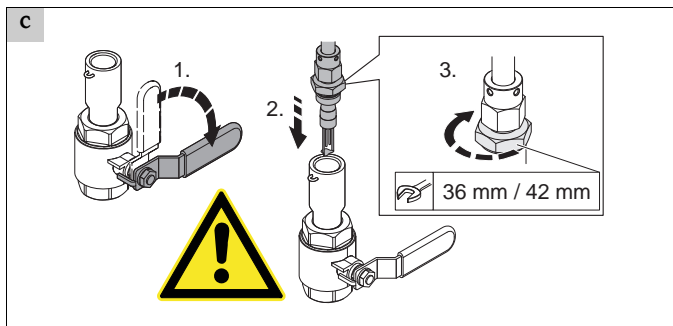
**9 Installation of measuring device**

**Caution!**  
 Danger of leaks! Use a suitable seal material.  
 → b: Tighten the coupling hand-tight  
 → c: Tighten the coupling securely



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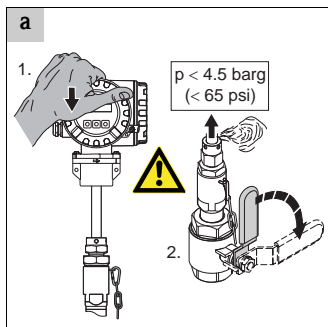
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**10 Aligning the calculated insertion depth**

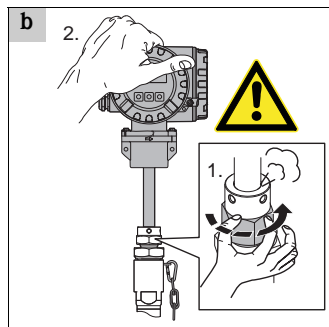
**Warning!**

- Risk of injury! The sensor can accelerate to high speeds. If the sensor is exposed to the full process pressure, high internal forces act on the sensor. Therefore, it must be ensured that the insertion sensor is not able to accelerate to dangerous speeds. The following measures should be taken:
  - Ensure that the process pressure is lower than 4.5 barg (65 psi).
  - Hold the sensor firmly by hand and open the coupling slowly. Only open the coupling until the sensor can be moved easily by hand.
  - The size of the force should be such that it is possible to position the sensor at the correct insertion depth by hand.
- Hot surfaces! Risk of injury! Before commencing work, allow the system and measuring device to cool down to a touchable temperature.

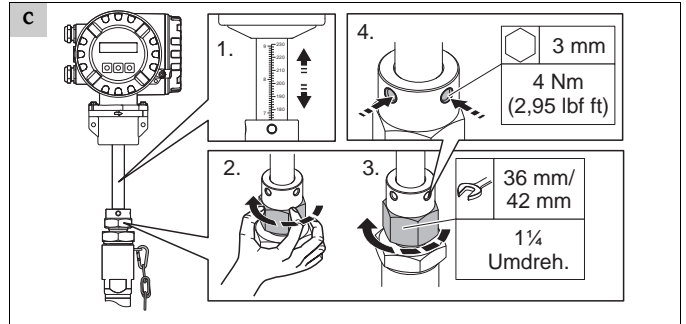
**Caution!**  
 Risk of damaging the pipe and sensor: do not insert the sensor too deeply.



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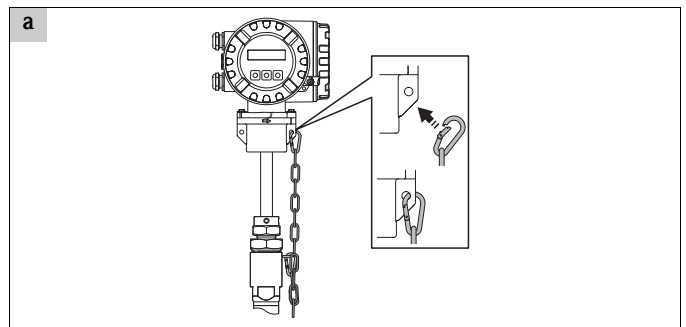


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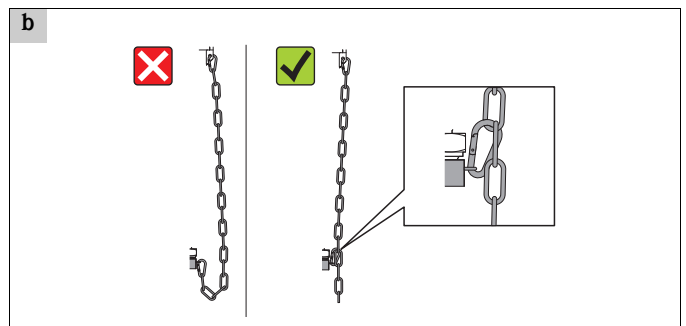
1. Align the scale to the calculated insertion depth.
2. Tighten the compression fitting by hand to secure the position of the sensor.
3. Turn the sensor so that the arrow marking matches the direction of flow. The scale on the shaft then points in the direction of the flow.
4. Using an open-ended wrench/spanner, tighten another 1 1/4 revolutions in a clockwise direction.
5. Fix the two securing screws.
6. Observe torque: 4 Nm (2.95 lbf ft)

**11 Adjusting the safety chain**

**Warning!**  
 Make sure the chain is taut or keep the chain short. Attach the carabiner hook to the eyelet and the last possible link in the chain.



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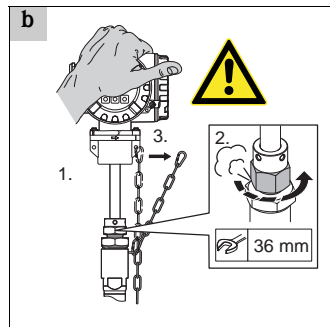
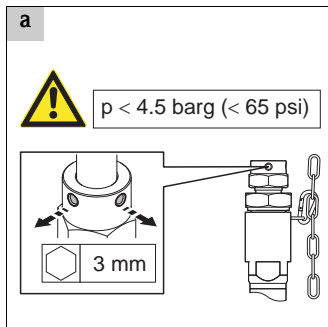


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**12 Removing the measuring device**

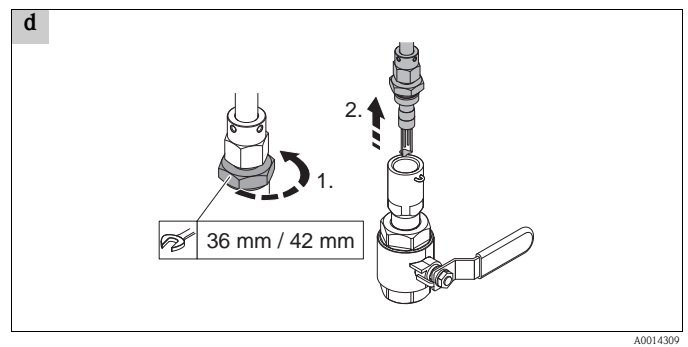
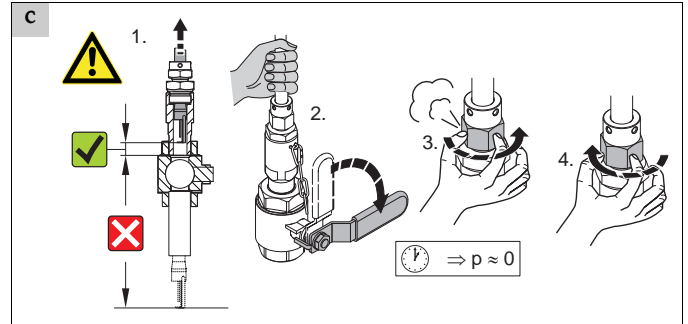
**Warning!**

- The measuring device is energized.  
 Danger: Risk of electric shock! Open the measuring device in a de-energized state only.
- If the measuring device is removed with the cables attached: Ensure that the cables allow sufficient room to remove the measuring device.
- Risk of injury! The sensor can accelerate to high speeds. If the sensor is exposed to the full process pressure, high internal forces act on the sensor. Therefore, it must be ensured that the insertion sensor is not able to accelerate to dangerous speeds. The following measures should be taken:
  - Ensure that the process pressure is lower than 4.5 barg (65 psi).
  - Before releasing the compression fitting, ensure that the safety chain is properly and tightly connected to the hot-tap and sensor fastening points.
  - When opening the coupling, hold the sensor firmly by hand. Open the coupling to the point that the sensor can be moved easily by hand. Ensure that the forces on the device can be controlled by hand. Only then release the chain and carefully remove the device.
- Hot surfaces! Risk of injury!  
 Before commencing work, allow the system and measuring device to cool down to a touchable temperature.



**Caution!**

- Small quantities of gas can escape when the lock screw is opened. Leave the lock screw open until the remaining pressure has escaped. Close the lock screw again to secure the sensor.
- Risk of damaging the sensor by closing the ball valve! Make sure that the measuring device is pulled out as far as it will go.



**Medium pressure version**

The extractor assembly is used for two applications:

- Fixed assembly for replacing the sensor
- Mobile tool to install or remove the sensor at high temperatures

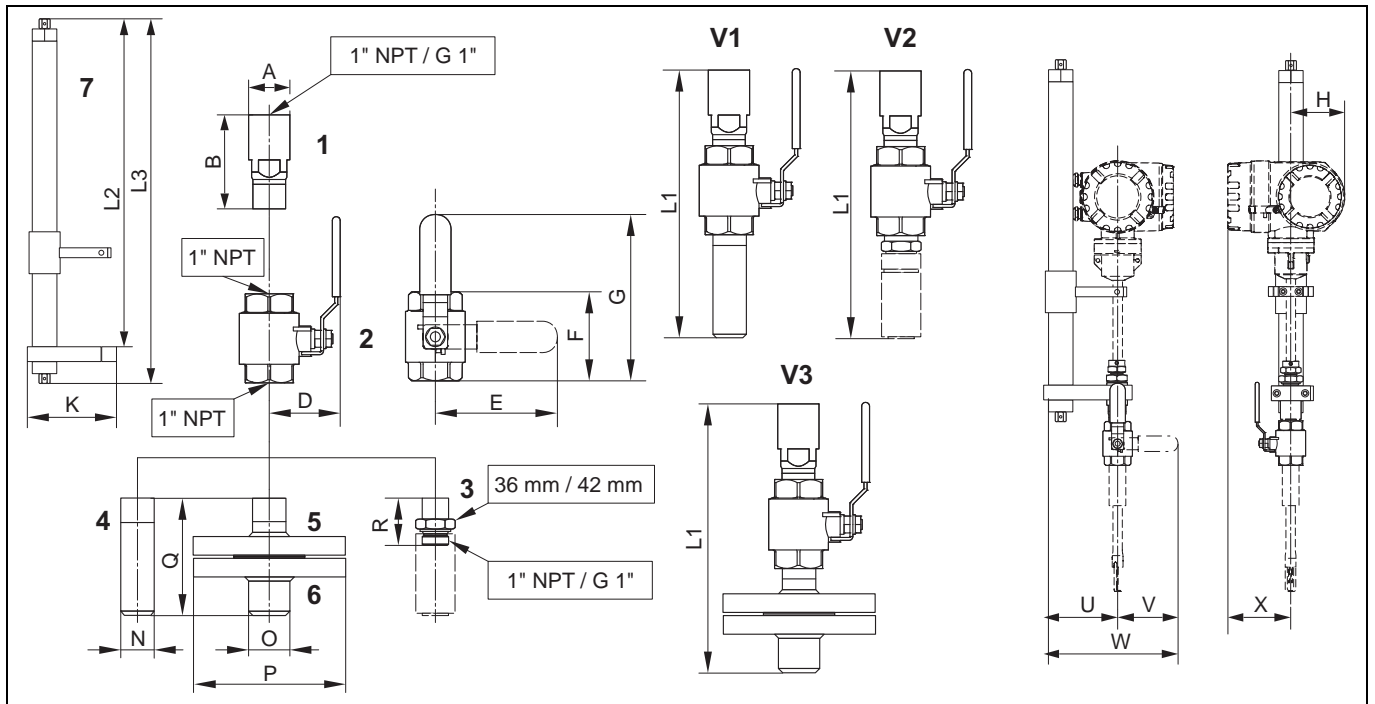
**1 Safety Instructions**

- Comply with national regulations governing mounting, electrical installation, commissioning, maintenance and repair procedures.
- Requirements with regard to specialized technical staff for the mounting, electrical installation, commissioning, maintenance and repair of the measuring devices:
  - trained in instrument safety
  - familiar with the individual operation conditions of the devices
  - for Ex-certified measuring devices: also trained in explosion protection
- Use genuine parts from Endress+Hauser only.
- If you have any questions, contact your E+H service organization.
- Modifications of the equipment are not permitted.
- Follow the Operating Instructions for the device.
- Only open housing for a brief period. Avoid the penetration with foreign bodies, moisture or contaminants.
- Before removing the device: set the process in a safe condition.
- Hot surfaces! Risk of injury! Before commencing work, allow the system and measuring device to cool down to a touchable temperature.
- Wear protective gloves and eye protection.
- The measuring device is energized. Danger: Risk of electric shock! Open the measuring device in a de-energized state only.
- In the case of installation in safety-related applications in accordance with IEC 61508 or IEC 61511: After repair, recommission in accordance with Operating Instructions. Document the repair procedure.
- Replace defective seals/gaskets with genuine parts from Endress+Hauser only.
- If threads are damaged or defective, the measuring device must be repaired.
- If threads are damaged or defective on mounting set parts they must be repaired.
- The Hot tap is permitted for use only with non-toxic, innocuous gases classified as "Group II" in accordance with the European directive 67/548/ EWG art. 2.

**2 Special Safety Instructions**

- Before inserting or removing the t-mass 65I: Make sure that the process pressure is lower than 16 barg (232 psi).
- The compression fitting must be tightened manually before the valve is opened.
- Secure the screws on the extractor assembly with glue if the extractor assembly is a fixed installation assembly and exposed to strong vibrations.
- At ambient temperatures above 50 °C (122 °F), it is recommended to use the extractor assembly as a mobile tool.
- Due to the weight of the hot tap extractor assembly, a support is required to protect the pipe when installing horizontally, for example.
- When installing the weld-in nipples, pay attention to the safety and installation instructions in the operating manual.
- Check the welding seams and screw connections for leaks.
- NPT/BSP pipe thread: use suitable seal material.

**3 Dimensions**



	A	B	D	E	F	G	L1	L2	L3	N	O	P	Q	R	U	V	W	X
[mm]	42.4	96	71	165	88	209	~249.5	133	148	33.4	33.4	123.9	105.5	61	150	165	215	129
[inch]	1.67	3.78	2.80	6.50	3.46	8.23	~9.82	5.24	5.83	1.31	1.31	4.88	4.15	2.40	5.91	6.50	8.46	5.08

Weight in [kg] ([lbs])			
V1	V2	V3	Extractor (7)
1.8 (4.0)	4.3 (9.5)	2.2 (4.9)	7.8 (17.2)

- 1 Sensor connection
- 2 Ball valve
- 3 Retrofit adapter
- 4 Weld-in nipple (process connection)
- 5 Flange adapter
- 6 Flange (process connection)
- 7 Extractor assembly

**Tool List**

19, 36, 40, 42 mm	3, 6 mm	Torque wrench 4 Nm < M < 12 Nm	Seal material for NPT/BSP pipe thread
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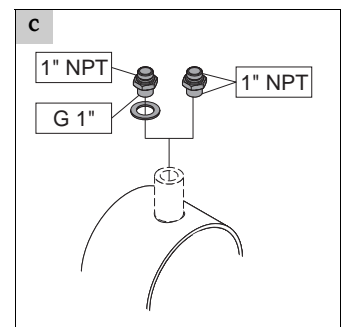
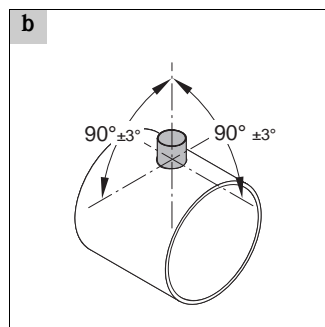
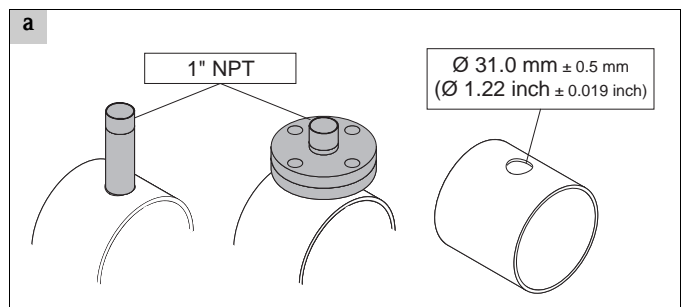
**4 Mounting the weld-in nipple or the adapter**

**Warning!**

- When mounting the fitting to a thin wall duct, use a suitable support bracket for the sensor and weld the welding socket to a base plate to spread the load. Otherwise, the mounting may be unstable and the duct wall can be damaged.
- When installing the weld-in nipples, pay attention to the safety and installation instructions in the operating manual.

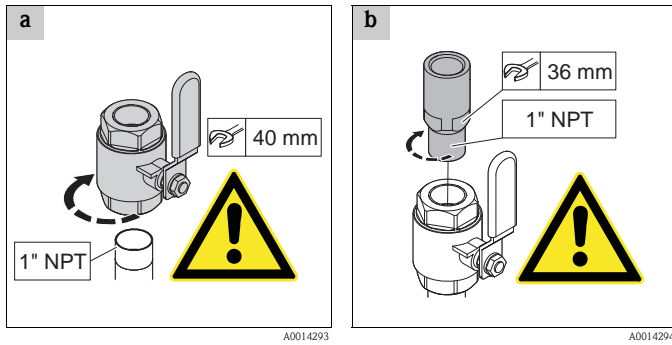
- a: Process connection for weld-in nipple and flange: drill or cut hole to diameter.
- b: Align process connection correctly.
- c: For existing mounting boss (DK6MB-...), a retrofit adapter can be used.

Material (process connection): 1.4404 according to EN 10272 and 316/316L according to A479

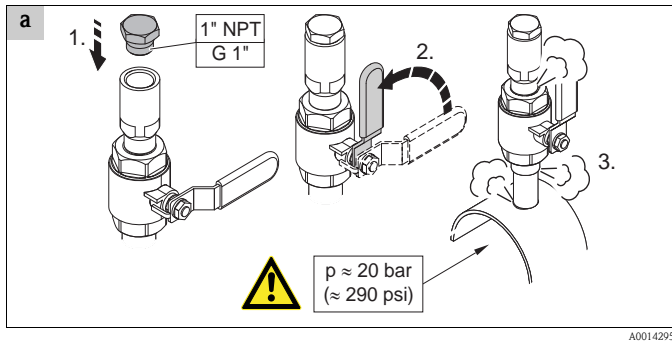


**5 Mounting of the ball valve**

**Caution!**  
Danger of leaks! Use a suitable seal material.



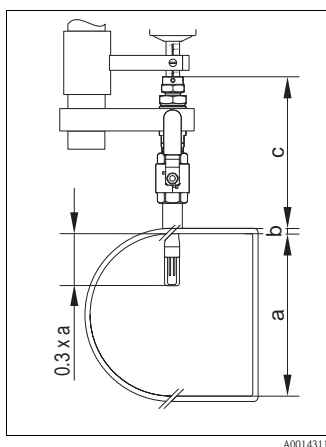
**6 Leak-proof check**



**7 Selecting the length of the insertion sensor**

For detailed information on the choice of the length of the insertion version and the ranges of adjustment, please contact your Endress+Hauser service organization.

**8 Calculate the insertion depth**



a = Internal diameter for round pipes.  
Duct height for a duct if the sensor is to be installed vertically, or the duct width, if it is to be installed horizontally.  
(a = min. 80 mm or 3 inch).

b = Thickness of the pipe wall or duct wall

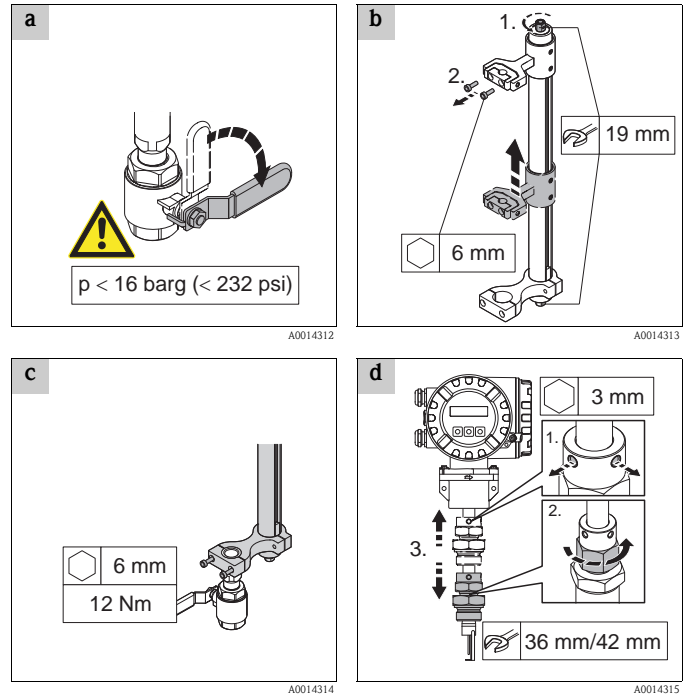
c = Depth of the welding nozzle at the pipe or duct including the sensor pipe union and Hot tap mounting set.

Calculated insertion depth:

$$\text{Insertion depth} = (0.3 \times a) + b + c + 2 \text{ mm}$$

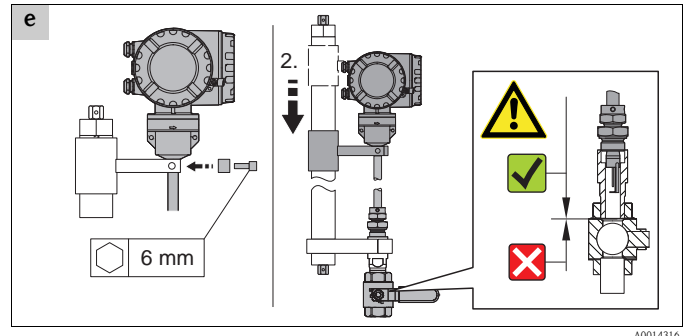
$$\text{Insertion depth} = (0.3 \times a) + b + c + 0.079 \text{ inch}$$

**9 Installation of measuring device**



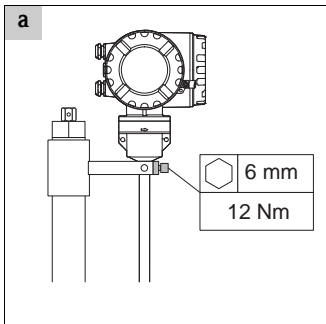
**Caution!**

- Danger of leaks! Use a suitable seal material.
- Danger of damaging the sensor with the ball valve! Do not place the sensor on the ball valve.

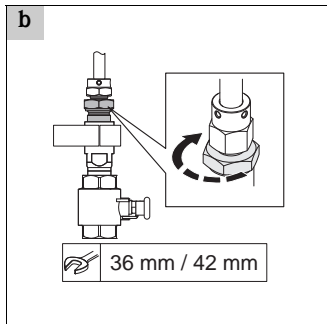


### 10 Securing the measuring device

→ **b**: Tighten the coupling securely.



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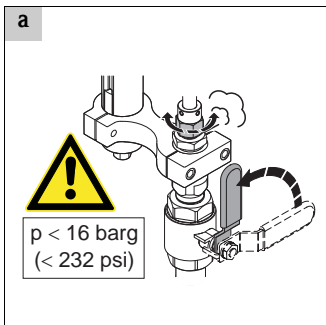


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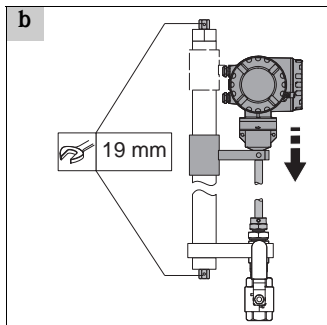
### 11 Adjusting to the calculated insertion depth

Close the pipe union if too much gas escapes

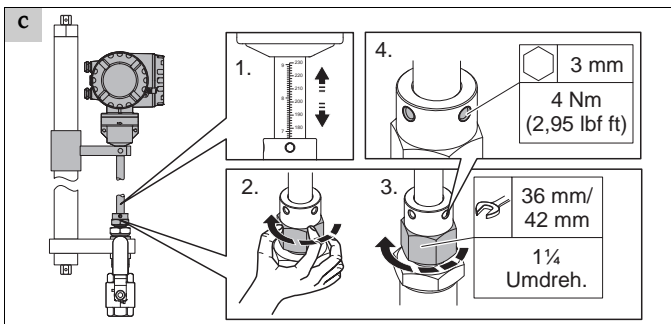
Keep the pipe union open far enough that the sensor can be fed in without resistance.



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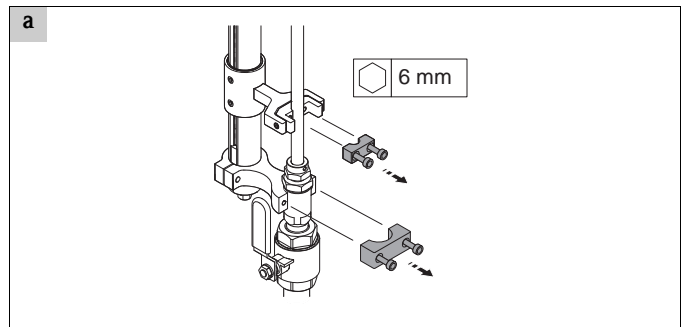
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1. Align the scale to the calculated insertion depth.
2. Tighten the compression fitting by hand to secure the position of the sensor.
3. Turn the sensor so that the arrow marking matches the direction of flow. The scale on the shaft then points in the direction of the flow.
4. Using an open-ended wrench/spanner, tighten another 1¼ revolutions in a clockwise direction.
5. Fix the two securing screws.  
Observe torque: 4 Nm (2.95 lbf ft)

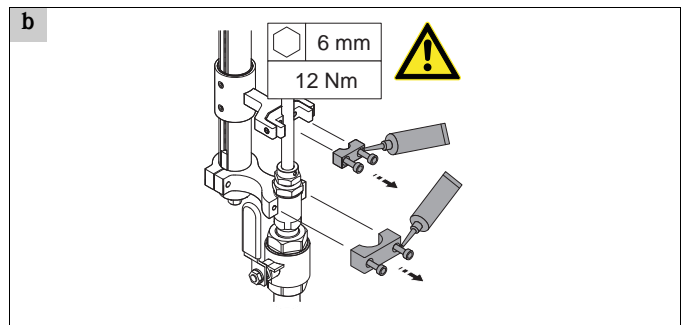
### 12 Removing the hot tap



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**Caution!**

Secure the screws on the extractor assembly with glue if the extractor assembly is a fixed installation assembly and exposed to strong vibrations.



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**13 Removing the measuring device**

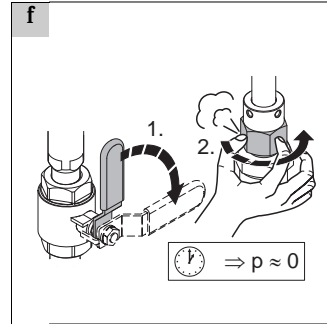
**Warning!**

- The measuring device is energized.  
 Danger: Risk of electric shock! Open the measuring device in a de-energized state only.
- If the measuring device is removed with the cables attached: Ensure that the cables allow sufficient room to remove the measuring device.
- Risk of injury! The sensor can accelerate to high speeds. If the sensor is exposed to the full process pressure, high internal forces act on the sensor. Therefore, it must be ensured that the insertion sensor is not able to accelerate to dangerous speeds. The following measures should be taken:  
 Make sure that the process pressure is lower than 16 barg (232 psi).
- The measuring device can be removed with the cables: Ensure that the cables allow sufficient room to remove the measuring device.
- Hot surfaces! Risk of injury!  
 Before commencing work, allow the system and measuring device to cool down to a touchable temperature.

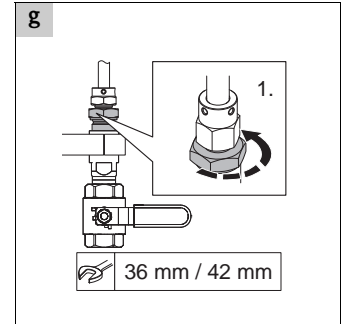


**Caution!**

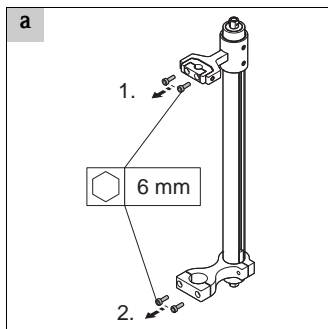
Small quantities of gas can escape when the lock screw is opened. Leave the lock screw open until the remaining pressure has escaped. Close the lock screw again to secure the sensor.



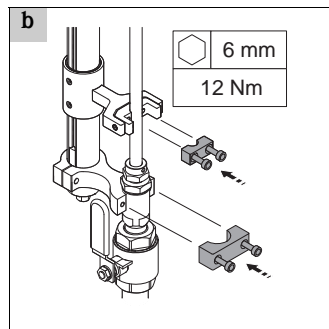
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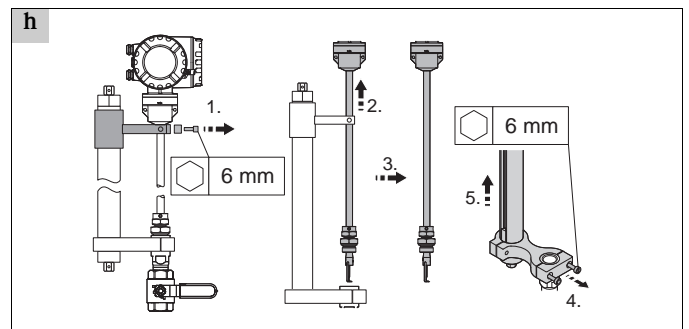
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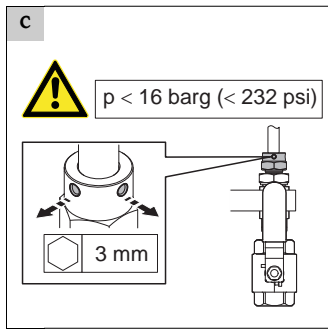
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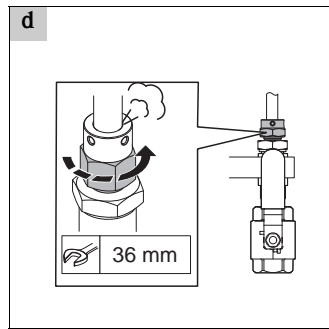
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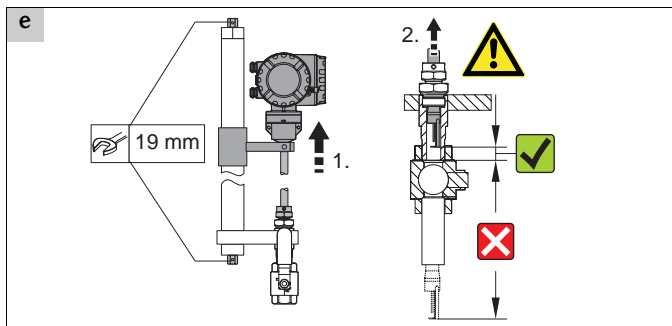


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**Caution!**

Risk of damaging the sensor by closing the ball valve! Make sure that the measuring device is pulled out as far as it will go.



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