SENSOFIT RET 5000 Technical Datasheet

Manual retractable assembly

- Variable immersion length up to 720 mm
- With ball valve for easy sensor exchange without process interruptions
- Bayonet coupling for easy sensor demountability and high safety requirements

1.1 SENSOFIT RET 5000

The SENSOFIT RET 5000 is a hand-operated retractable assembly with ball valve made of stainless steel for online measurements in pipes, tanks or vessels. Due to the very long, flexible adjustable immersion length the sensor can be very far inserted in the process. It provides the ability to separate the sensor under current process conditions from the process to carry out a cleaning or calibration. The innovative design provides maximum safety for ease of use.

Highlights

- Robust design, with ball valve
- Automatic locking mechanism at too high process pressures
- Stainless steel AISI 316L / 1.4404 and 1.4408 / CF8M (ball valve)
- Immersion length up to 720 mm / 28,3" nominal
- High variation of process connections
- Applicable up to 12 bar / 174 psi and 130°C / 266°F
- Operable up to 4 bar / 58 psi

Industries

- Wastewater (industrial and municipal)
- Pulp and paper
- Power
- Chemical
- Petrochemical

Applications

- The application depends mainly on the used sensor.

1.2 Design and options

High safety level
Intuitive and safe operation is one of the key features of this assembly. First, the handle for removing the sensor with the immersion tube is blocked by an open ball valve; consequently it prevents wrong opening procedure and assures safely removing the sensor with the ball valve closed. Second, the Bayonet locking systems features an automatic locking mechanism at too high process pressures. And finally, the design prevents the immersion tube from shooting out of the assembly at high pressure because the sensor holder will be blocked by the end stop of the sliding device.

Variable immersion length
The sensor immersion length of the standard assemblies is up to 720 mm / 28.3" or 320 mm / 12.6", the exact length is depending on the process connection. The exact immersion position of the sensor can be set individually on side by a simple one screw adjustment. By this the assembly fits perfectly in most measuring points.

Process connections and cleaning ports
The assembly can be configured with different threats and flanges as process connections. Furthermore different cleaning connections can be selected. This allows sensor cleaning without removal from the assembly. The rinsing chamber can also be used to clean the sensor in the assembly from hazardous residues prior to disassembly.

Made to Fit

Mounting assemblies SENSOFIT series

As a complete provider for process analysis, we naturally offer a complete range of assemblies. In addition to retractable and immersion assemblies, there is also a range of flow-through and insertion assemblies, in a wide range of materials available. Special versions for special operating conditions are available on request.

The following individual assemblies are available:

- SENSOFIT FLOW 1000 series - Flow-through assemblies
- SENSOFIT IMM 1000 / 2000 series - Immersion assemblies
- SENSOFIT INS 1000 / 7000 series - Insertion assemblies
- SENSOFIT RET/RAM 5000 series - Manual and pneumatic retractable assemblies

For further information please consider the technical datasheets.

2.1 Technical data

Technical data of the assembly

Design

Length	770 mm / 30.32" or 1170 mm / 46.06"
Diameter	320 mm / 12.6"
Cleaning ports without hose or pipe connections (optional)	G1/8 female thread with blanking plug (with NBR sealing)
Cleaning ports with hose or pipe connections (optional)	G1/4 or 1/4-18 NPT female thread with blanking plug (with NBR sealing)
Requirements to the sensor	Process screw connection: PG13.5
	Sensor diameter: 12 mm / 0.47"
	Sensor length: 120 mm / 4.7"
Weight	approx. 3 up to 15 kg / 6.6 up to 33 lb

Operating conditions

Max. permissible temperature	+130°C / +266°F
Max. permissible pressure (process operation)	12 bar / 174 psi
Max. permissible pressure (retractable function)	4 bar / 58 psi (only non-Ex devices)
Flushing pressure	1...12 bar / 14.5...174 psi

Wetted material

Immersion tube with protection cage	1.4404 / 316L
Process connection	1.4404 / 316L
Ball valve	1.4408 / CF8M
Ball valve sealing	PTFE (glass fibre reinforced)
O-rings	EPDM, FPM or FFKM
Sliding rings	PTFE
Cleaning chamber	1.4404 / 316L
Adhesive bonding of ball valve threads	Loctite® 648

Non-wetted material

Cable feedthrough	Polyamide with EPDM sealing
Handle	PVC
Bayonet locking	1.4404 / 316L
Assembly lever	1.4404 / 316L and PVC
O-rings	EPDM, FPM or FFKM
Sliding rings	PTFE and bronze

Ambient conditions

Ambient temperature	-10...+60°C / +14...+140°F
Transport and storage temperature	-20...+80°C / -4...+176°F

Approvals and certificates

CE	
The device meets the essential requirements of the EU directives. The CE marking indicates the conformity of the product with the union legislation applying to the product and providing for CE marking. For full information of the EU directives and standards and the approved certifications, please refer to the EU declaration on the KROHNE website.	
Other approvals and standards	
Pressure Equipment Directive	2014/68/EU
Ex	ATEX: II2G Ex h IIC T6...T4 Gb

2.2 Dimensions

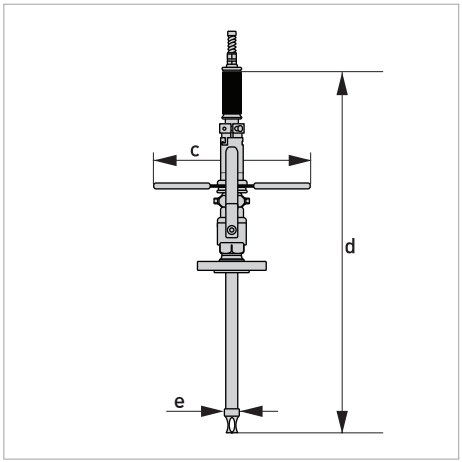

Figure 2-1: RET 5000 Dimensions

	Immersion depth 300 mm / 11.81"	Immersion depth 700 mm / 27.56"
c	320 mm / 12.6"	320 mm / 12.6"
d	770 mm / 30.32"	1170 mm / 46.06"
e	ø 30 mm / ø 1.18"	ø 30 mm / ø 1.18"

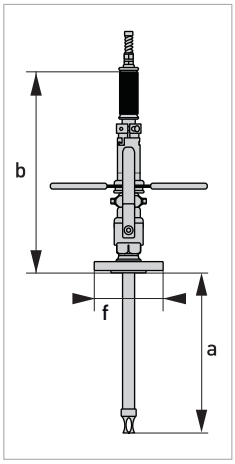

Figure 2-2: Process connection flange with ball valve

	Immersion depth 300 mm / 11.81"	Immersion depth 700 mm / 27.56"
a	variable 0...325 mm / 0...12.80"	variable 0...725 mm / 0...28.54"
b	variable 440...920 mm / 17.32...36.22"	variable 443...1320 mm / 17.05...51.96"
f	DN32 PN16, ANSI 1 1/4 150 lbs DN50 PN16, ANSI 2 150 lbs	

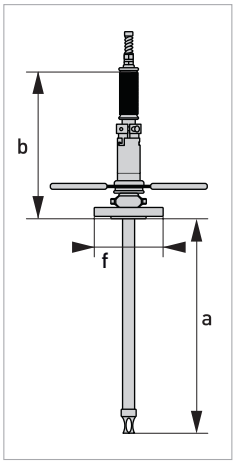

Figure 2-3: Process connection flange without ball valve

	Immersion depth 300 mm / 11.81"	Immersion depth 700 mm / 27.56"
a	variable 0...413 mm / 0...16.22"	variable 0...813 mm / 0...32.00"
b	variable 357...834 mm / 14.06...32.83"	variable 357...1234 mm / 14.05...48.58"
f	DN32 PN16, ANSI 1 1/4 150 lbs DN50 PN16, ANSI 2 150 lbs	

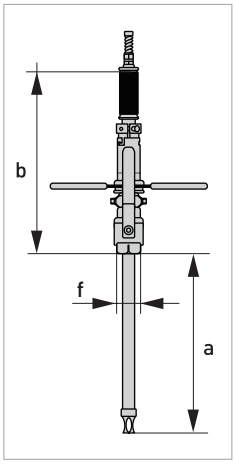

Figure 2-4: Process connection thread with ball valve

	Immersion depth 300 mm / 11.81"	Immersion depth 700 mm / 27.56"
a	variable 0...320 mm / 0...12.60"	variable 0...720 mm / 0...28.35"
b	variable 450...927 mm / 17.72...36.50"	variable 450...1327 mm / 17.72...52.24"
f	male G1 1/4, 1 1/4-11.5 NPT	

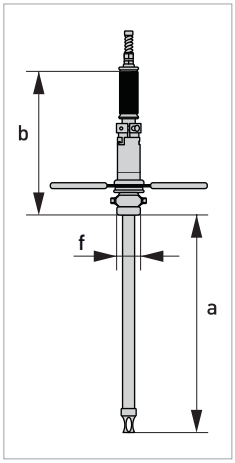

Figure 2-5: Process connection thread without ball valve

	Immersion depth 300 mm / 11.81"	Immersion depth 700 mm / 27.56"
a	variable 0...406 mm / 0...15.98"	variable 0...806 mm / 0...31.73"
b	variable 364...841 mm / 14.33...33.11"	variable 364...1241 mm / 14.33...48.86"
f	male G1 1/4, 1 1/4-11.5 NPT	

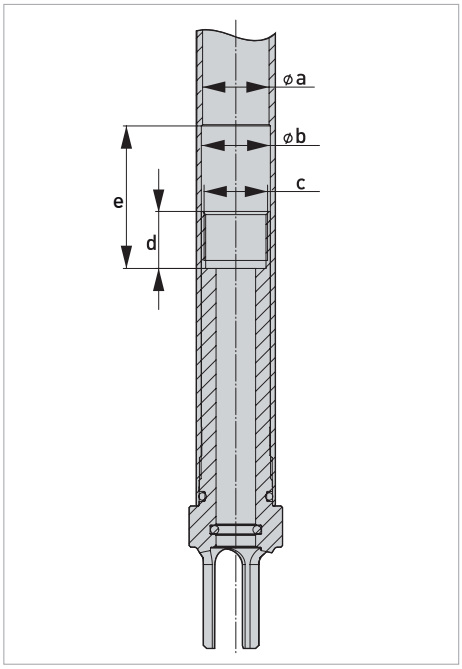

Figure 2-6: Inner tube housing

	Dimension [mm]	Dimension [inch]
a	ø 21	ø 0.83
b	ø 21.8	ø 0.86
c	PG 13.5	
d	18	0.71
e	45	1.8

3.1 General notes on installation

For devices used in hazardous areas, additional safety notes apply; please refer to the Ex documentation.

Only devices with ATEX approval may be used in the corresponding hazardous areas.

No use in areas with potential flammable surroundings.

Do not expose the assembly to intense vibration.

If using abrasive media or processes which lead to accelerated wearing, check the assembly in shorter intervals.

The threat connection below and above the ball valve are secured connection (glued). Do not try to open them.

Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.

Do a check of the packing list to make sure that you have all the elements given in the order.

Look at the device nameplate to ensure that the device is delivered according to your order.

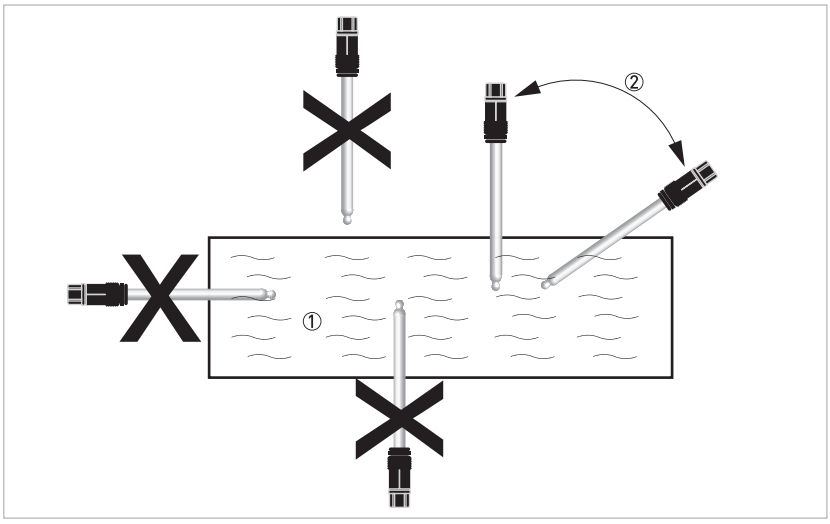

Figure 3-1: Installation requirements

① Measuring medium
② Maximum deviation of 75° from vertical position

The mounting position of the assembly should ensure, that when installed, the sensor is typically at an angle of 0...75 degrees from the vertical.

3.2 Intended use

Responsibility for the use of the devices with regard to suitability, intended use and corrosion resistance of the used materials against the measured fluid lies solely with the operator.

The manufacturer is not liable for any damage resulting from improper use or use for other than the intended purpose.

The SENSOFIT RET 5000 retractable assembly is designed to be fixed to containers, tanks, tubings or pipelines. A sensor will be inserted into the process liquid with the aid of the immersion tube with sensor cage. The retractable immersion tube is operated by hand. Maintenance can be carried out whilst the process is running.

3.3 Pre-installation requirements

Ensure for the measuring point that

- the process is switched off.
- there is sufficient working space available for operation of the retractable assembly.
- containers or pipelines are depressurised, empty and clean.
- the connection flange and the retractable assembly process connection fit together.
- the process O-ring is lying on the connection flange.
- the device must not be heated by radiated heat (e.g. exposure to the sun) to a electronics housing surface temperature above the maximum permissible ambient temperature. If it is necessary to prevent damage from heat sources, a heat protection (e.g. sun shade) has to be installed.

Ensure for the assembly that

- the ball valve is closed.
- the sliding device is separated from the rinsing chamber.

The cleaning chamber connections must be closed by blanking plugs or the cleaning connection have to be closed and its valve can withstand the process pressure. Otherwise the assembly may not be immersed into the process!

3.4 Install the assembly

It should be noted that the rinsing function will work properly only when being operated with sufficient pressure (max. 6 bar). Take process pressure into account (flange versions). Make sure that all components come with a sufficient pressure rating and are mounted pressure-tight.
To avoid backflow of process fluid into the rinsing hose consider installing a check-valve.

Make sure that

1. the system is prepared.
   For more information refer to *Pre-installation requirements* on page 11.
2. the assembly is prepared.
   For more information refer to *Pre-installation requirements* on page 11.

The ball valve is installed as follows

1. Put the ball valve onto the process connection (place an O-ring between them).
2. Tighten the process connection securely.

3.4.1 Install the sensor

Do not operate the assembly without sensor. Always install the sensor before installing the immersion tube.

All sensors with a diameter of 12 mm, a connection thread of PG 13.5 and a length of 120 mm like the analogue and digital sensors from KROHNE fit into the assembly. For other sensors check the dimensions.

Step 1

- Take off the cable gland at the top of the immersion tube.

At the bottom end of the immersion tube there is a protection cage including a sensor holder.

- Remove this sensor holder by turning it in an anti-clockwise direction.

Step 2

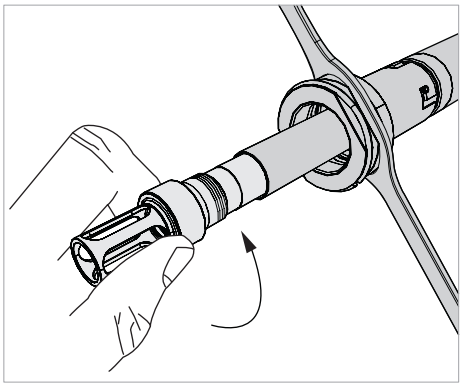

Figure 3-2: Remove the sensor holder

- Hold the handle while unscrewing the sensor holder from the immersion tube.

Step 3

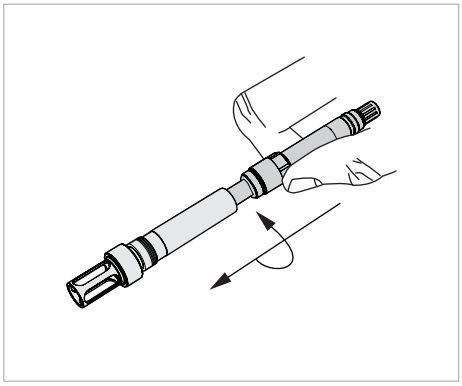

Figure 3-3: Install the sensor into the sensor holder

- Screw the sensor into the sensor holder.
- Screw the sensor cable feeded through the immersion tube onto the sensor.

Step 4

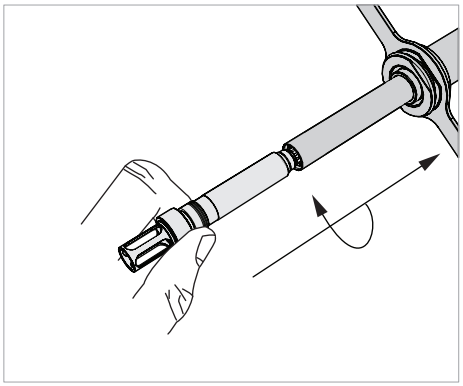

Figure 3-4: Install the sensor

- Screw the sensor holder into the immersion tube and tighten it securely.
- Tighten the cable gland on the top of the immersion tube.

3.4.2 Adjust the immersion depth

The immersion tube can be unfastened by the process pressure if the bayonet unit is not correctly installed!
Risk of injury to the user caused by the immersion tube springing out.The bayonet unit must be properly installed.

The assemblies immersion depth can be steplessly adjusted in order to achieve the optimal measuring position for the sensor.

Step 1

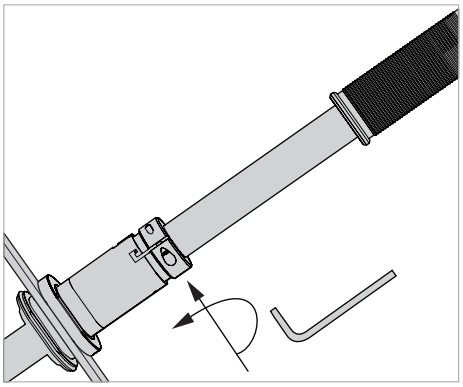

Figure 3-5: Adjusting the immersion depth

- Open the socket head screw on the bayonet socket with an allen key.

Step 2

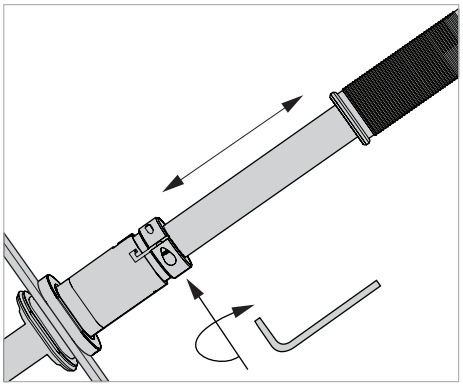

Figure 3-6: Adjusting the immersion depth

- Move the immersion tube until the desired immersion depth has been reached.
- Tighten the socket head screw on the bayonet socket firmly (6 Nm / 4.43 ft lb).

3.4.3 Install the sliding device

Clean the assembly and the sensor to prevent burns or chemical burns depending on the properties of the process fluid.
A sensor must be installed before installing the sliding device into the assembly! Process fluid can escape through the immersion tube if no sensor is installed!

The sliding device is installed as follows.

Step 1

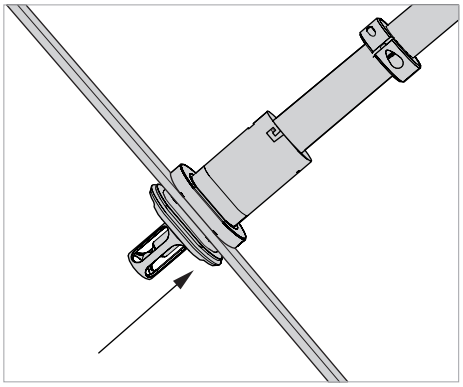

Figure 3-7: Move the immersion tube

- Pull the immersion tube out to the end stop in the sliding device.

Step 2

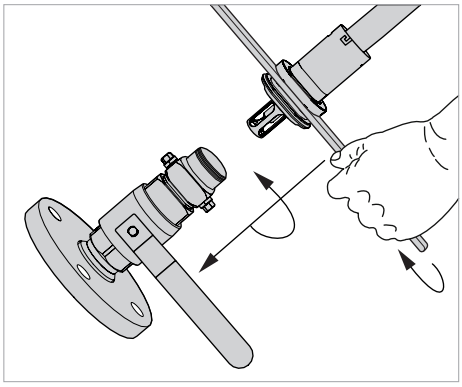

Figure 3-8: Install the immersion tube

- Screw the immersion tube onto the rinsing chamber and make sure that the ball valve remains closed.
- Tighten the sliding device with the help of the assembly lever!

➲ The sliding device is now installed and the retractable assembly is ready for use.

Be aware of the correct handling of the assembly lever. Lift the assembly lever that it fits to the upper jaw to turn.

3.4.4 Install the flush tube

It should be noted that the rinsing function will work properly only when being operated with sufficient pressure (max. 6 bar). Take process pressure into account (flange versions). Make sure that all components come with a sufficient pressure rating and are mounted pressure-tight.
To avoid backflow of process fluid into the rinsing hose consider installing a check-valve.

The sensor can be flushed without the need to remove it from the assembly. For this purpose, flushing fluid must be supplied to and drained out of the flushing chamber. If no flush tubes are installed then the flushing connections must be closed using blanking plugs.

Clean the assembly and the sensor to prevent burns or chemical burns depending on the properties of the process fluid.
A sensor must be installed before installing the sliding device into the assembly! Process fluid can escape through the immersion tube if no sensor is installed!

Only suitably trained personnel should handle these types of assemblies.

If the process pressure is higher than the flushing pressure then the process fluid can run into the rinsing lines.
The flush tubes must be installed with a shut-off valve at the flushing connections!

If the flushing fluid pressure rises to more than 12 bar then the assembly may be damaged. Check besides the technical data of the cleaning valve the one of the used sensor.
If required, install a pressure regulator!

Dirty flushing fluid can damage the sensor.
Install a rinsing line with dirt trap at the rinsing connection!

Step 1

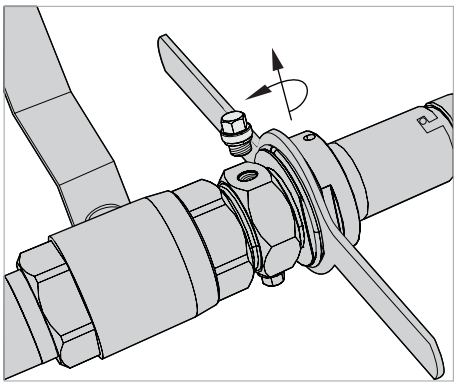

Figure 3-9: Remove the blanking plug

The flush tubes are installed as follows:

- Install a valve and dirt trap in the flush tube for the intake of the flushing fluid.
- Remove the blanking plug installed at the factory and install the flush tube for intake.
- Install a valve in the flush tube for the draining of the flushing fluid.
- Remove the blanking plug installed at the factory and install the draining pipe.
- Check to ensure all connections are tight.

The rinsing fluid pressure must be at least 1 bar in order to ensure that the sensor is properly cleaned!

Step 2

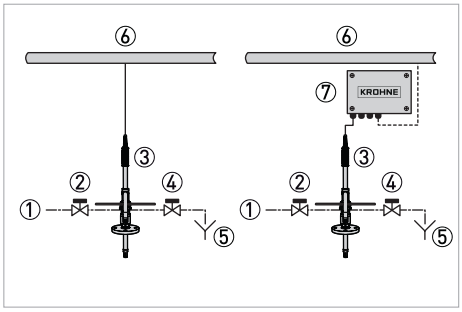

Figure 3-10: Process flow

① Cleaning solution
② Shut-off Valve
③ Sensor cable
④ Shut-off Valve
⑤ Drain
⑥ Process control system
⑦ Junction box

1. Firmly hold the immersion tube when loosening the bayonet locking as process pressure may potentially cause the tube to retract through the ball valve at a high velocity.

2. Having retracted the immersion tube and closed the ball valve, flush out the cleaning chamber with a suitably safe liquid. If the ball valve or components are damaged fluid may leak.This can cause a hazard to personnel.

4.1 Order code

The characters of the order code highlighted in light grey describe the standard.

VGHE	4	Assembly type								
		A	SENSOFIT RET 5000							
			Approvals							
			0	None						
			1	ATEX						
				Materials						
				1	Stainless steel 1.4404 / 316L and 1.4408 / CF8M (ball valve)					
					Sealing materials					
					1	EPDM (incl. FDA / USP VI)				
					2	FPM				
					3	FFKM				
						Sensor type				
						1	120 / 12 mm, PG 13.5			
							Process connection			
							1	Flange DN 32 PN 16		
							2	Flange DN 50 PN 16		
							3	Flange ASME 1 1/4 150 lb		
							4	Flange ASME 2 150 lb		
							5	G 1 1/4 thread (male)		
							6	1 1/4 NPT thread (male)		
								Process shut-off		
								0	None	
								1	Ball valve	
									Cleaning connection	
									0	None
									1	G 1/8 thread (female)
									2	G 1/4 thread (female)
									3	1/4 NPT (female)
										Insertion length
										3	300 mm / 11.8"
										7	700 mm / 27.5"

										Documentation		
										0	None	
										1	German	
										2	English	
											Certificates	
											0	None
											1	EN 10204-3.1 for wetted material; 2.1 for EPDM material, FDA conform
VGHE	4											

ATEX version only in combination with ball valve available!

KROHNE – Process instrumentation and measurement solutions

- Flow
- Level
- Temperature
- Pressure
- Process Analysis
- Services

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