

# Technical Information

## Cleanfit CUA451

Manually operated retractable assembly for water, wastewater and process media



### Application

- Drinking water and process water:
  - Filter monitoring and filter backflushing
  - Monitoring of phase separation processes
  - Raw water monitoring
  - Sludge treatment in water works
- Wastewater treatment plants:
  - Sludge in recirculation lines
  - Sludge centrifuge monitoring
  - Primary sludge and sludge treatment
- Process media from all types of industry:
  - Raw water and process water monitoring
  - Cooling water monitoring
  - Recirculation lines
  - Sludge treatment in water works

### Your benefits

- One assembly for all applications
- Sensor cleaned without interrupting the process
- Robust design: process pressure up to 10 bar (145 psi), manually operable up to 2 bar (29 psi)
- Process adaptation using 2" threaded adapter or flange

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## Function and system design

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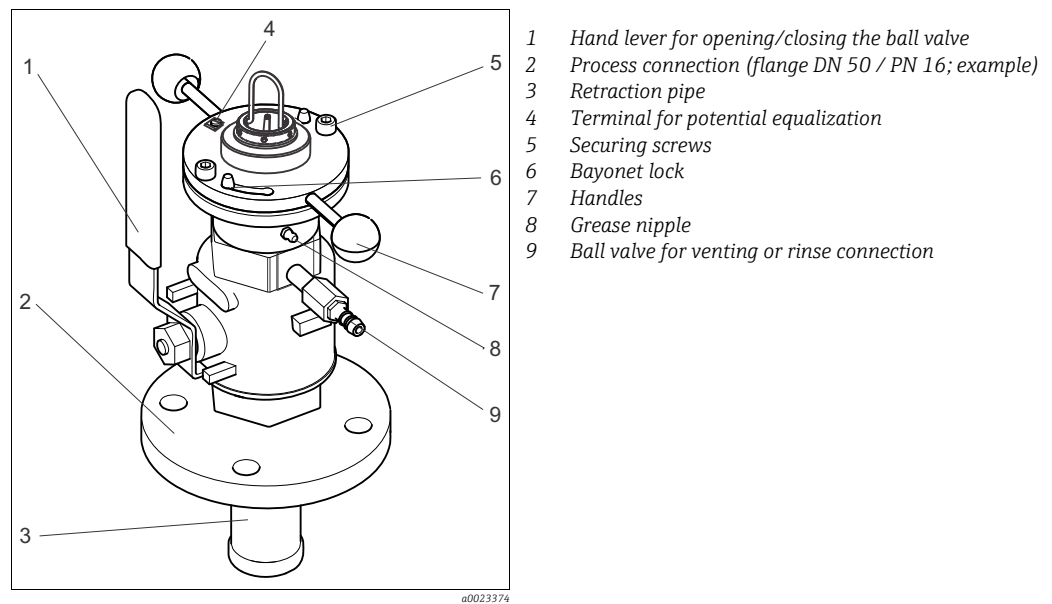
### Function

The assembly is manually operated.

**i** The vent cock or the rinse connections (if used) are in open contact with the medium in the measuring position and when the assembly is moving, and are therefore exposed to the process pressure. Make sure that the vent cock or the rinse connections (if used) are closed when moving the assembly!

In the "Service" state (sensor moved back into the assembly as far as possible and **ball valve closed**), the assembly is sealed off from the process by the ball valve. This means that cleaning and calibration can be performed, or the sensor can be replaced, without interrupting the process.

The assembly can be moved manually under process conditions up to a process pressure of approx. 2 bar (29 psi).

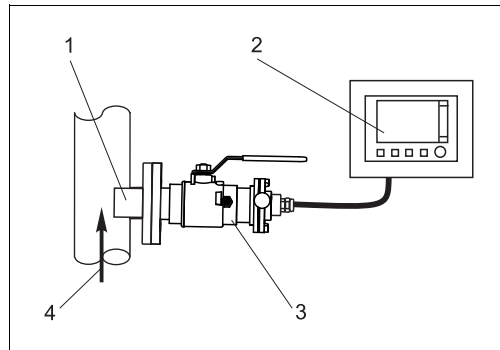


Assembly in operational state (ball valve open)

## Measuring system

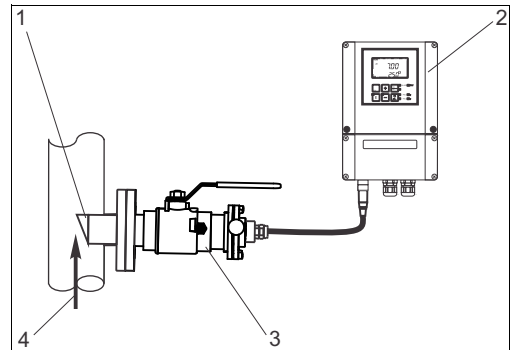
A complete measuring system comprises:

- Cleanfit CUA451 assembly
- Turbimax CUS41/CUS31/CUS51D or CUS52D turbidity sensor
- Liquiline CM44x or Liquisys M CUM223/253 transmitter



Measuring system with CUS51D

- 1 Turbimax CUS51D turbidity sensor
- 2 Liquiline CM44x multichannel transmitter
- 3 Cleanfit CUA451 retractable assembly
- 4 Flow direction of the medium



Measuring system with CUS31 or CUS41

- 1 CUS31 or CUS41 turbidity sensor
- 2 Liquisys M CUM253
- 3 Cleanfit CUA451 retractable assembly
- 4 Flow direction of the medium

## Installation

### Installation instructions

Install the assembly in places with uniform flow conditions. The minimum pipe diameter is DN 80.

- i** The installation instructions depend on the sensor used. Detailed installation instructions are provided in both the Technical Information and the Operating Instructions for the sensor in question.

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## Environment

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**Ambient temperature range** 0 to 50 °C (32 to 122 °F)

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## Process

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**Medium pressure** Max. 10 bar (145 psi)

- i** For manual insertion/retraction of the assembly the medium pressure may not exceed 2 bar (29 psi)!  
Also take the process conditions of the sensor used into consideration!

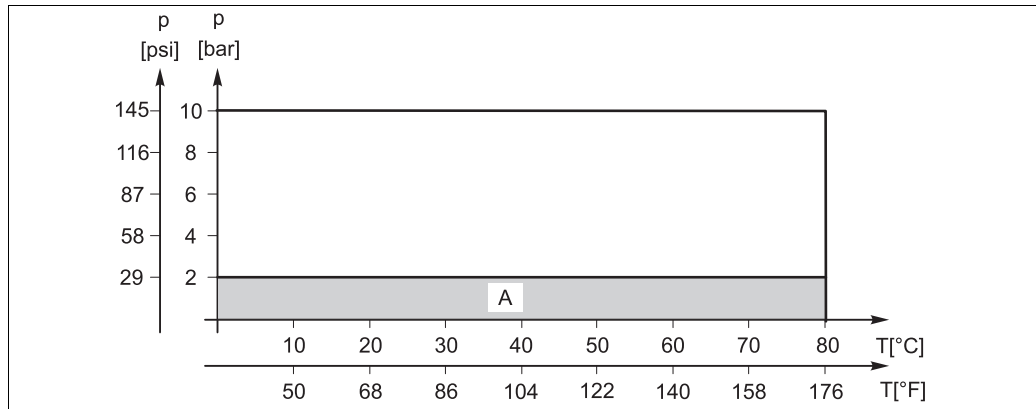
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**Medium temperature** 0 to 80 °C (32 to 176 °F)

- i** Take the maximum medium temperature for the sensor into consideration!

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### Pressure-temperature ratings



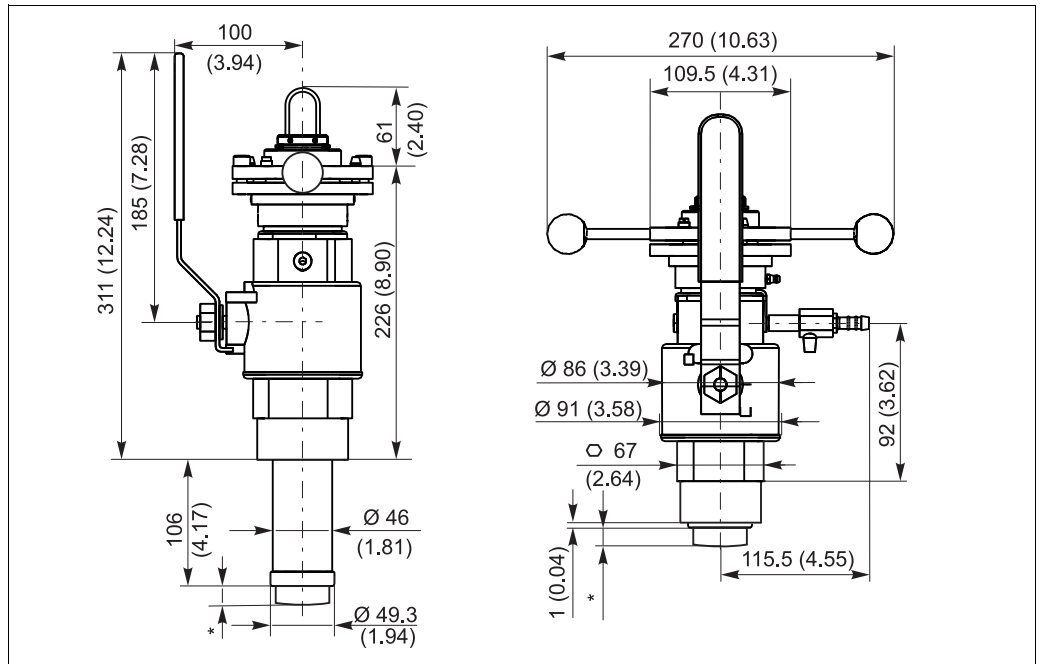
*Pressure-temperature ratings*

A Range in which the assembly can be operated manually

# Mechanical construction

## Design, dimensions

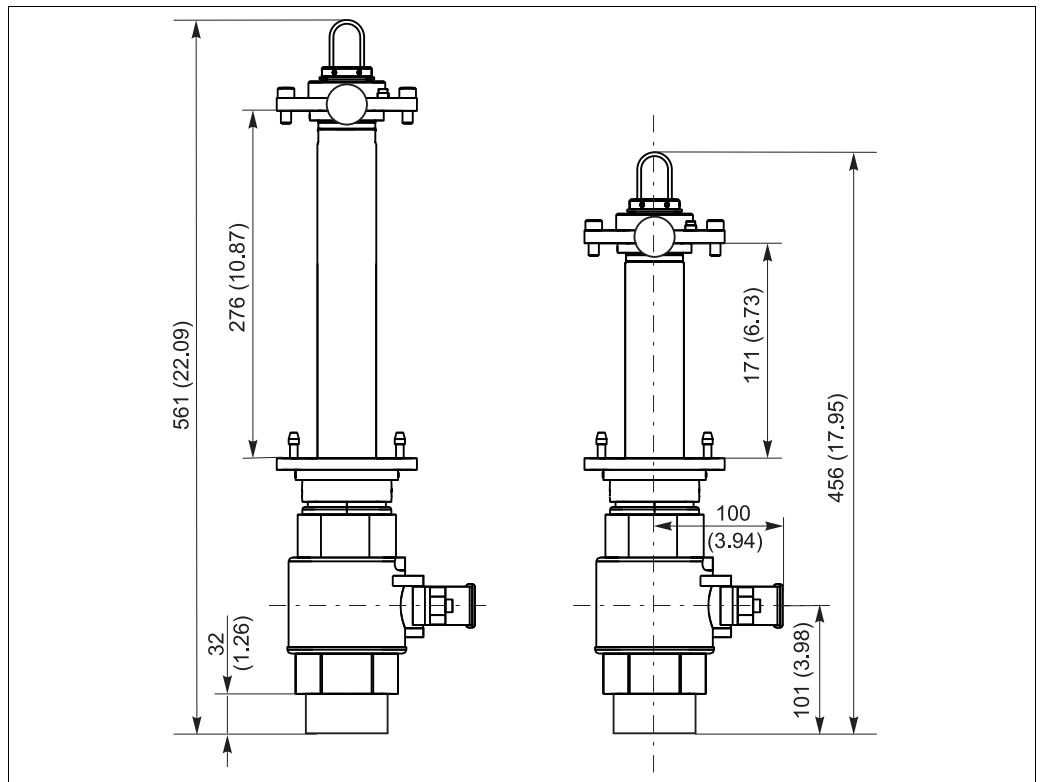
Assembly with G2 thread and weld-in adapter in measuring position (long and short stroke)



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Dimensions in mm (inch)

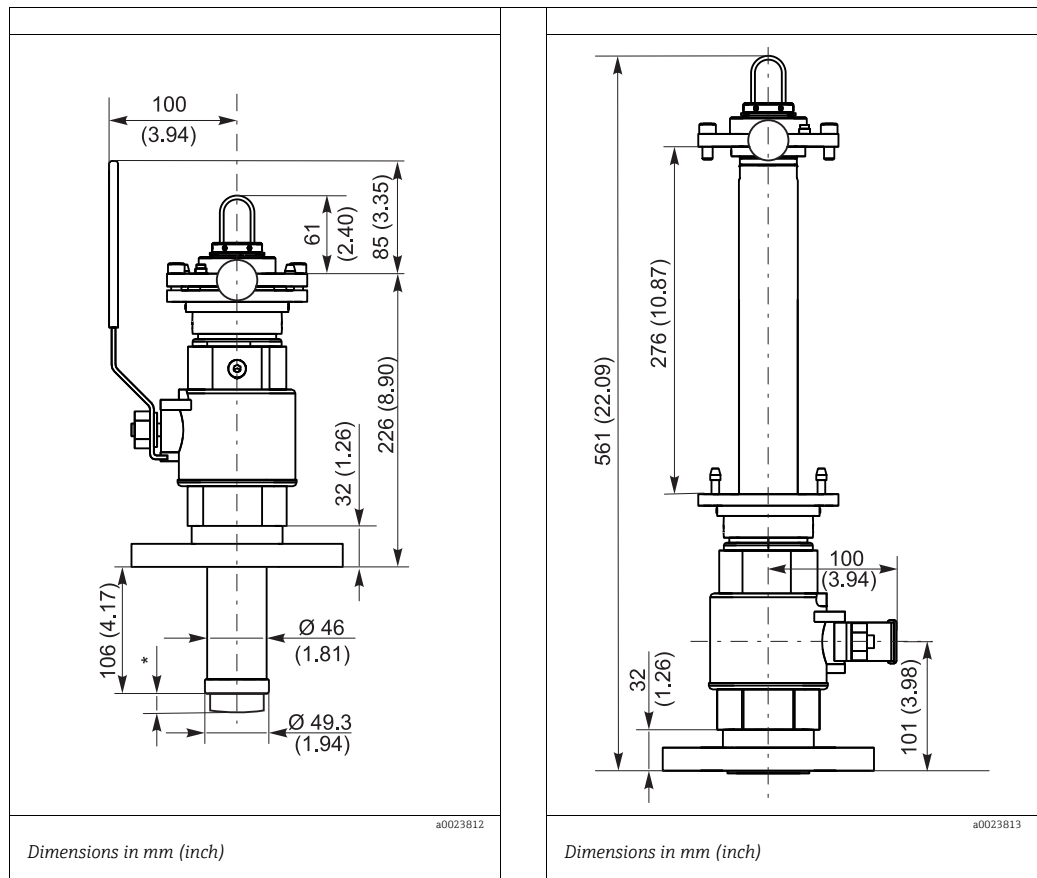
Assembly with G2 thread and weld-in adapter in service position (long and short stroke)



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Dimensions in mm (inch)

Assembly with flange connection (only for long stroke)



\* Dimensions depend on sensor:

CUS31/41: 14 mm (0.55") / 20 mm (0.79") (with wiper)

CUS52D: 26.5 mm (1.04")

CUS51D 10.5 mm (0.41")

**Sensors** CUS51D / CUS52D / CUS 41 / CUS 31

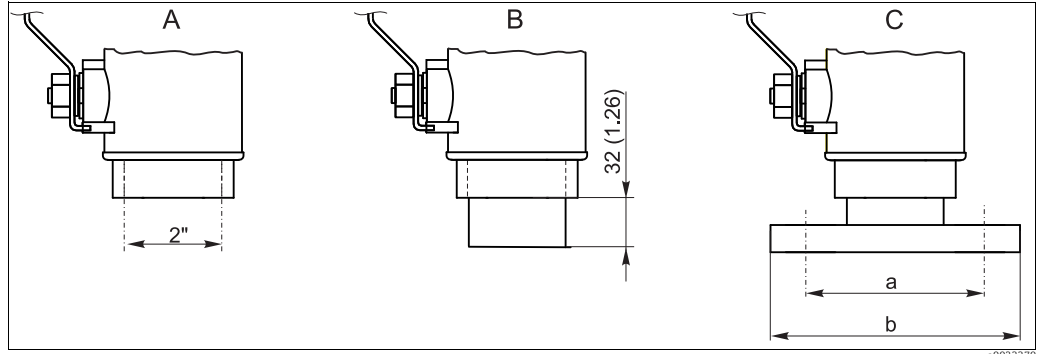
**Weight** Depending on version: 8 to 11 kg (17.6 to 24.3 lbs)

**Materials**

Wetted:	Viton (seals) Stainless steel 1.4404 (AISI 316L) Nickel-plated brass (vent cock or rinse connection)
Not wetted:	Stainless steel 1.4404 (AISI 316L)

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**Process connections**



Process connections. Dimensions in mm (inch)

- A Internal thread G2
- B Internal thread G2 with weld-in adapter
- C Flange DN 50 / PN 16 (as per EN 1092-1) and flange ANSI 2" / 150 lbs  
a: DN 50: Ø 125 (4.92), ANSI 2": Ø 120.7 (4.75)  
b: DN 50: Ø 165 (6.50), ANSI 2": Ø 152.4 (6.00)

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**Rinse connection nozzles**

2 x G1/8 (internal)

Connection options:

- 2 x ball valve with hose connection OD 9 mm (see "Accessories")  
(A ball valve is included in the delivery for the assembly. On its own it acts as a vent cock.)
- Customer's own rinse connections with G1/8 external thread

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**Vent cock**

Ball valve with hose connection OD 9 mm

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## Ordering information

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### Product page

You can create a valid and complete order code on the Internet using the Configurator.

Enter the following address in your browser to access the product page:  
[www.endress.com/cua451](http://www.endress.com/cua451)

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### Product Configurator

You can find the navigation area on the right of the product page.

1. Under "Device support", click "Configure the selected product".  
↳ The Configurator opens in a new window.
  2. Configure the device as per your requirements by selecting all the options.  
↳ In this way, you receive a valid and complete order code.
  3. Export the order code as a PDF file or Excel file. To do so, click the appropriate button at the top of the window.
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### Product structure



The product structures always reflect the situation at the time of publication. You can create a current and complete order code on the Internet using the Configurator.

Sensor stroke	
A	Short stroke, approx. 170 mm (only process connections A+B)
B	Long stroke, approx. 270 mm

Sensor type / connection	
1	For CUS51D / CUS41 / CUS31 with G1, sensor length approx. 200 - 220 mm
2	For CUS65 with G1, sensor length approx. 140 - 160 mm
3	For CUS52D with G1

Process connection	
A	G2 internal thread
B	G2 internal thread incl. weld-in adapter h = 50 mm
C	Flange DN 50 / PN 16 as per EN 1092-1
D	Flange ANSI 2" / 150 lbs

CUA451-				complete order code
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## Accessories

### Assembly

Ball valve for rinse chamber

- As rinse connection complementing or replacing the venting ball cock supplied;
- Order No. 51512982

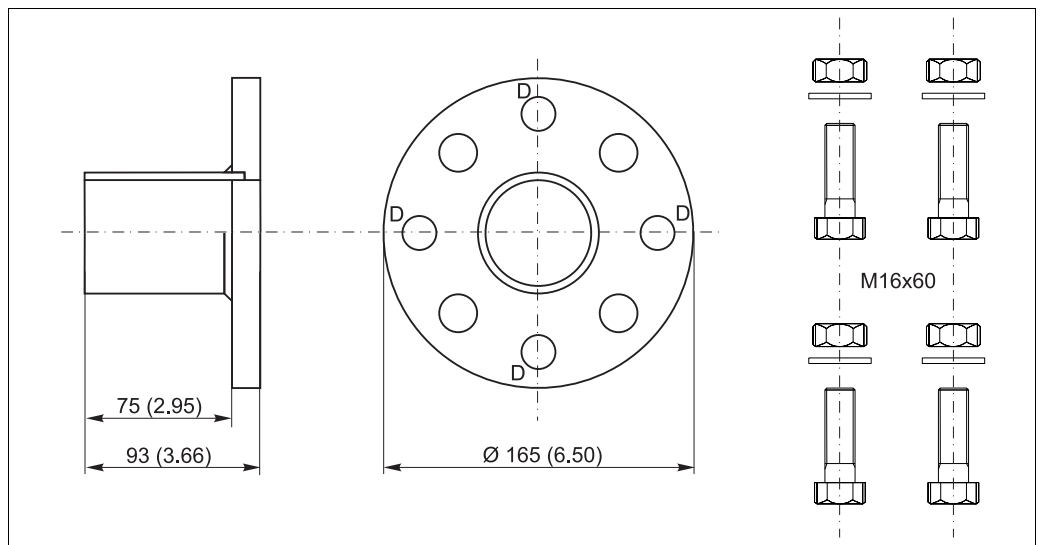
O-ring set

- Viton + FPM
- Order No. 51512981

### Process connection adapter

Welding socket

- Welding socket for pipe diameter from 80 mm, with combination flange DN 50 / ANSI 2":
  - Bores for flange DN 50: 4 x 90° Ø18 on bolt circle Ø125 (4.92)
  - Bores for flange ANSI 2": 4 x 90° Ø19 on bolt circle Ø121 (4.75)
- Flange seal, 4 screws M16x60, 4 nuts M16 incl. washers,
- Stainless steel 1.4571 (AISI 316 Ti)
- Order No. 50080249

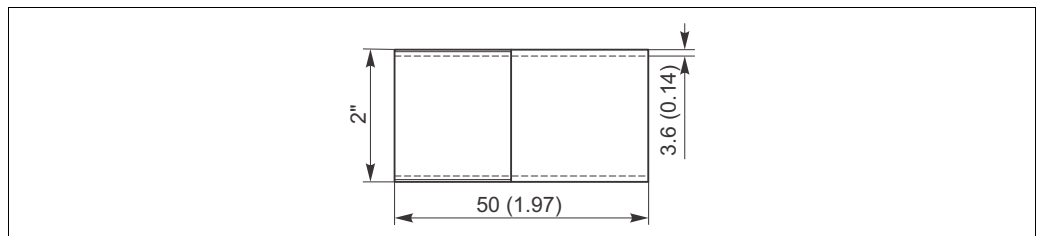


Welding socket, dimensions in mm (inch)

D: Markings for bores, flange DN 50

Welding nipple

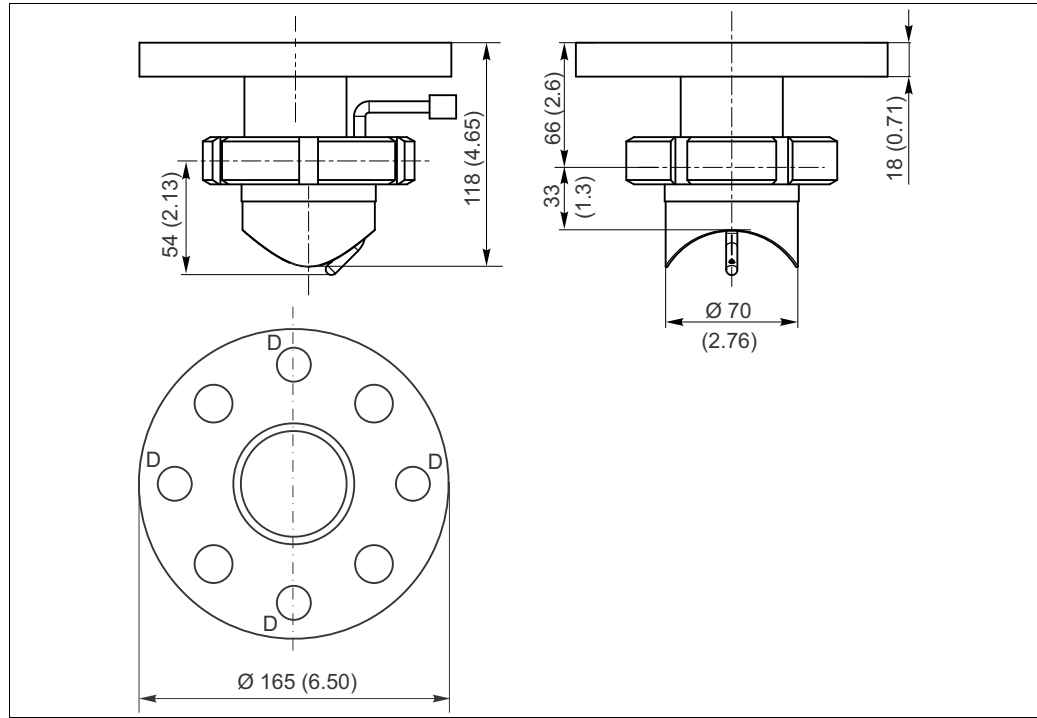
- Welding nipple for 2" thread
- Stainless steel 1.4404 (AISI 316L)
- Order No. 71265347



Welding nipple, dimensions in mm (inch)

### Welding rinse socket DN 65

- For the automatic spray cleaning of sensors CUS51D/31/41 in pipes and containers:
  - Bores for flange DN 50: 4 x 90° Ø18 on bolt circle Ø125
  - Bores for flange ANSI 2": 4 x 90° Ø19 on bolt circle Ø121
- Rinse connection: R $\frac{1}{4}$  external thread
- With removable rinse nozzle
- Up to 6 bar (87 psi), 80 °C (176 °F)
- Order No. 51500912



Welding rinse socket, dimensions in mm (inch)

D: Markings for bores, flange DN 50

## Sensors

### Turbimax W CUS31

- Turbidity sensor for drinking water and industrial water measurement according to the 90° scattered light principle
- Order as per product structure, [www.products.endress.com/cus31](http://www.products.endress.com/cus31)
- Technical Information TI00176C/07/EN

### Turbimax W CUS41

- Turbidity sensor for industrial water and solids content measurement according to the 90° scattered light principle
- Order as per product structure, [www.products.endress.com/cus41](http://www.products.endress.com/cus41)
- Technical Information TI00177C/07/EN

### Turbimax CUS51D

- For nephelometric measurements of turbidity and solids in wastewater
- Four-beam alternating light method based on scattered light
- With Memosens protocol
- Order as per product structure, [www.products.endress.com/cus51d](http://www.products.endress.com/cus51d)
- Technical Information TI00461C/07/EN

### Turbimax CUS52D

- Turbidity sensor for very low to average turbidity
- With Memosens protocol
- Order as per product structure, [www.products.endress.com/cus52d](http://www.products.endress.com/cus52d)
- Technical Information TI01136C/07/EN

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[www.addresses.endress.com](http://www.addresses.endress.com)

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