

# Technical Information

## Chemoclean CYR10B

Cleaning injector for universal use with dosing function for cleaning sensors



### Application

- Operation of cleaning systems with separate cleaning nozzle
- Execution of automatic cleaning cycles in retractable assemblies

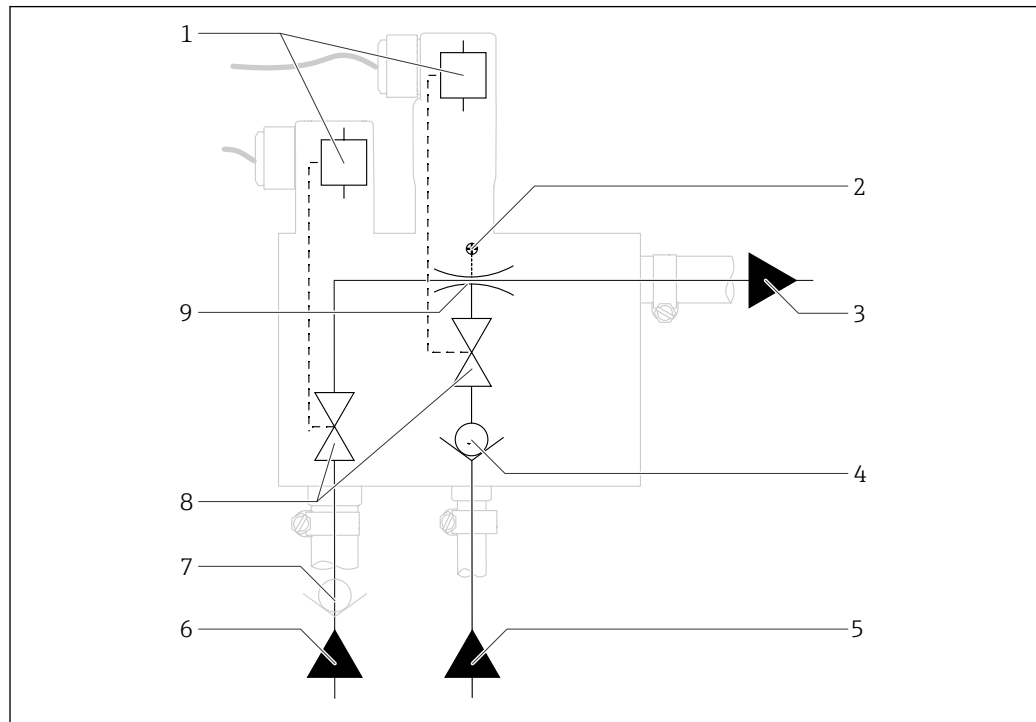
- The CYR10B cleaning injector is designed for the creation of automatic sensor cleaning systems with Liquiline CM442/444/448

### Your benefits

- Easy handling of rinsing medium thanks to concentrate dosing with motive water (water jet pump)
- Cleaning and rinsing cycles without additional dosing pump
- Adjustable dosing ratio of motive water to cleaning concentrate
- Excellent chemical resistance properties thanks to plastic rinsing block
- Easily fastened on wall or mounting plate

## Function and system design

### Equipment architecture



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#### 1 Operating principle

- 1 Valve controls
- 2 Metering screw
- 3 Outlet for cleaning mixture (the installation of a check valve is recommended on the assembly side)
- 4 Check valve
- 5 Inlet for cleaner (suction line)
- 6 Inlet for motive water
- 7 Check valve (to be provided by customer)
- 8 Solenoid valves
- 9 Water jet pump

The cleaning injector uses the Venturi principle to mix motive water and cleaner to form a cleaning mixture.

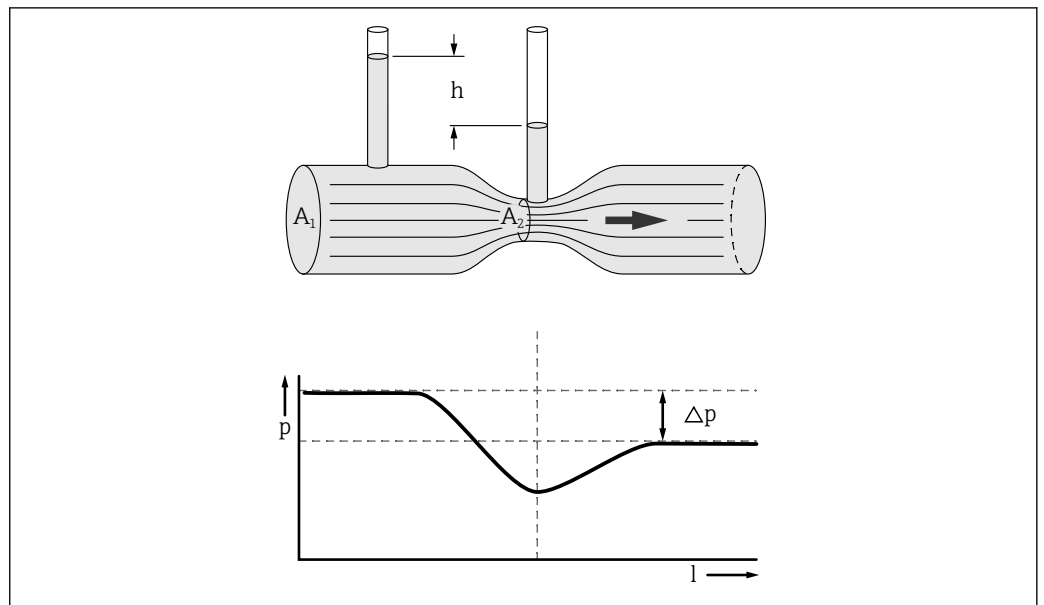
In the process, the motive water flows through a water jet pump (injector) to the spray head. The resulting negative pressure causes the cleaner to be sucked in and mixed with the motive water.

The flow rate of motive water and cleaner is controlled by the Liquiline CM44x via two solenoid valves in the injector.

The mixture ratio can be configured using a metering screw.

Hose lines are used to supply the motive water and cleaner and to route the cleaning mixture to the spray head.

### Operating principle



2 How a water jet pump works

The water jet pump installed in the injector functions without mechanical components in accordance with the Venturi principle.

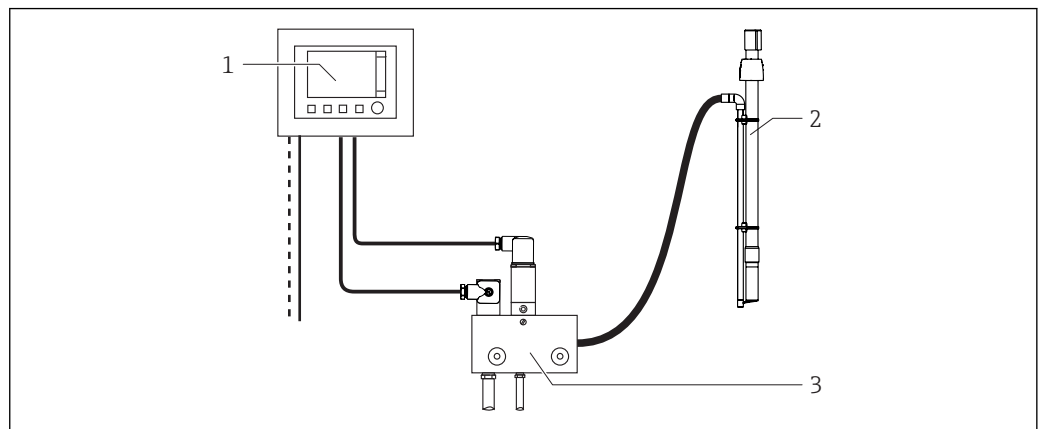
For this purpose, cross-section  $A_1$  of the motive water line within the injector is tapered in sections to match cross-section  $A_2$ .

The suction line for the cleaner is attached at the point of the narrowest cross-section. This is where the speed of the motive water is at a maximum. The high speed induces a negative pressure in the suction line, causing the cleaner to be sucked in and mixed with the motive water.

The suction process causes a reduction in pressure downstream from the water jet pump.

### Measuring system

#### Complete measuring system for spray cleaning



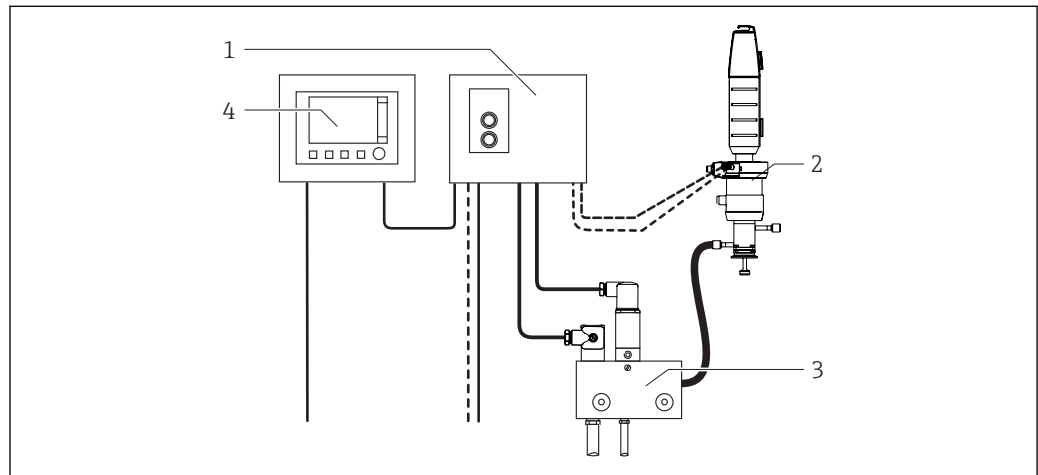
3 Measuring system without CYC25

- 1 Transmitter Liquiline CM44x
- 2 Assembly CYA112 with mounted spray cleaning 71158245
- 3 Cleaning injector CYR10B

A complete measuring system comprises:

- 1 cleaning injector CYR10B
- Liquiline CM44x (incl. sensor) with at least 2 relays and Chemoclean function
- Assembly with mounted spray cleaning (e. g. CYA112 with mounted spray cleaning 71158245 / 71158246)

#### Complete measuring system for retractable assembly



4 Measuring system with CYC25

- 1 Cleanfit Control CYC25
- 2 Pneumatic retractable assembly
- 3 Cleaning injector CYR10B
- 4 Transmitter Liquiline CM44x

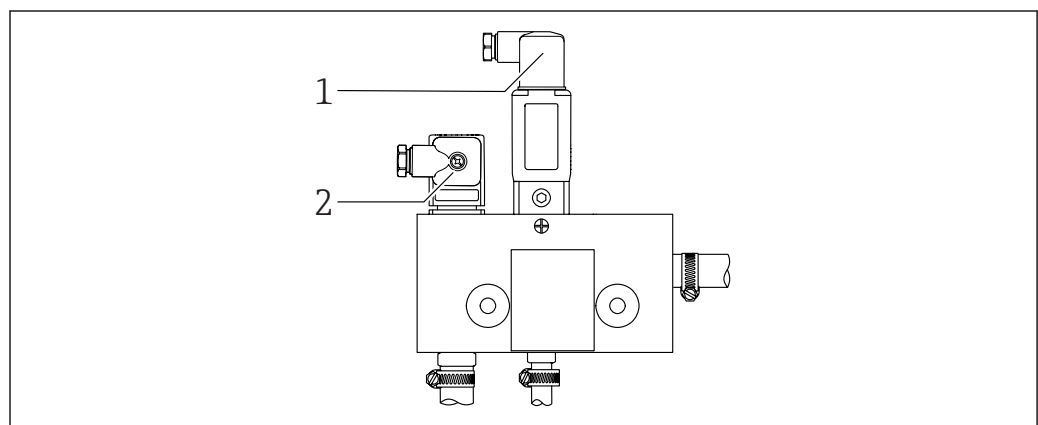
A complete measuring system comprises:

- 1 cleaning injector CYR10B
- Cleanfit Control CYC25 with pneumatic pilot valve to control the assembly
- Liquiline CM44x (including sensor) with at least 4 relays and Chemoclean Plus (optional 2 digital inputs for feedback)
- Pneumatically controlled retractable assembly, optionally with limit switches, e.g. Cleanfit CPA875 or CPA871 in standard version.

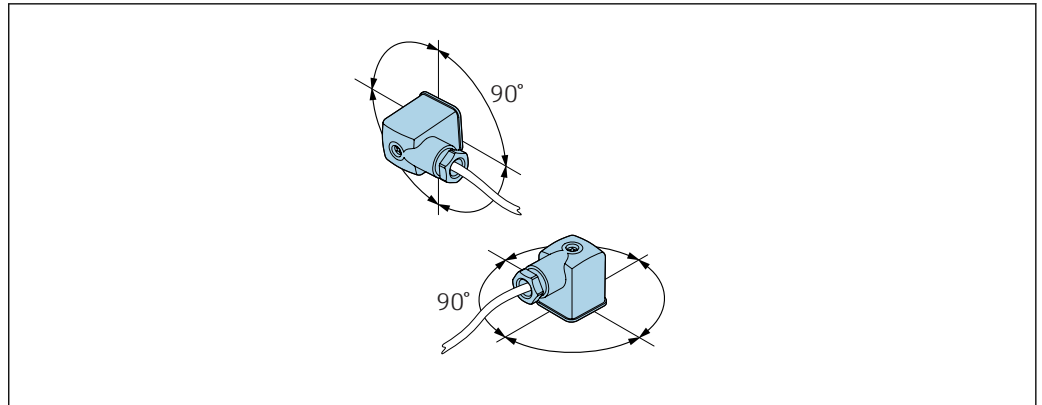
## Power supply

#### Device plugs available

The device has 2 device plugs:



- 1 Device plug for cleaner valve
- 2 Device plug for motive water valve



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Device plugs can be rotated in 90 ° stages.

### Supply voltage

Three different versions of the device supply voltage are available:

24 V<sub>DC</sub>

115 V<sub>AC</sub>

230 V<sub>AC</sub>

The device does not have a mains switch. A protected circuit breaker must be provided in the vicinity of the device at the place of installation.

### Power consumption

|               |  |
|---------------|--|
| 24 V version  | 2 solenoid valves, each with 8 W (16 W in total)   |
| 115 V version | 2 solenoid valves, each with 8 VA (16 VA in total) |
| 230 V version | 2 solenoid valves, each with 8 VA (16 VA in total) |

### Cable specification

#### Thickness of connecting cable

| Cable diameter                  | Cable cross-section  |
|---------------------------------|--|
| 6.0 to 8.0 mm (0.24 to 0.31 in) | 0.25 to 1.5 mm <sup>2</sup> (0.00039 to 0.0023 in <sup>2</sup> ) |

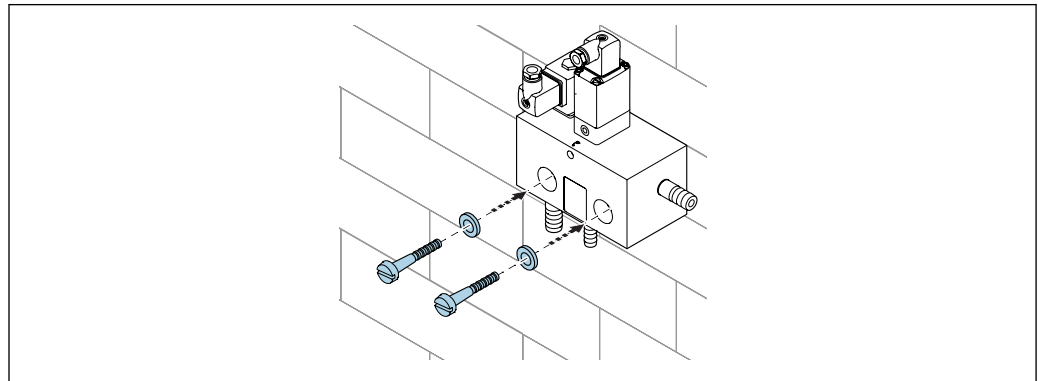
#### Length of connecting cable

| Cable between    | Maximum cable length |
|------------------|----------------------|
| CYR10B and CYC25 | 30 m (98 ft)         |
| CYR10B and CM44x | 30 m (98 ft)         |

## Installation

### Mounting location

### Wall mounting



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The device can be mounted on a variety of surfaces with suitable fastening equipment.

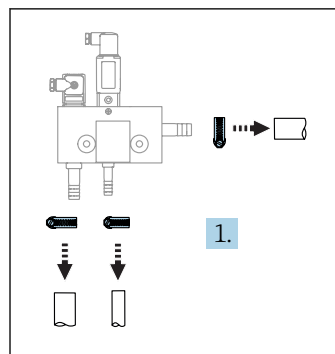
- Screw diameter: max. 9 mm (0.35 in)
- Length of bore in device: 63 mm (2.45 in)

**i** Fastening equipment must be provided by the customer at the place of installation.

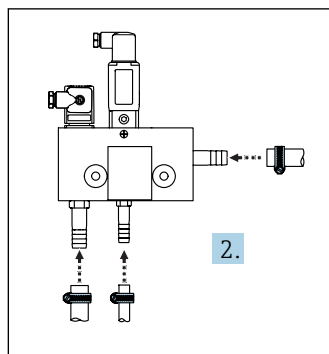
### Installation instructions

### Hose lines

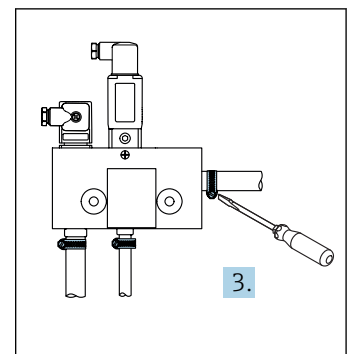
#### Attaching hose lines



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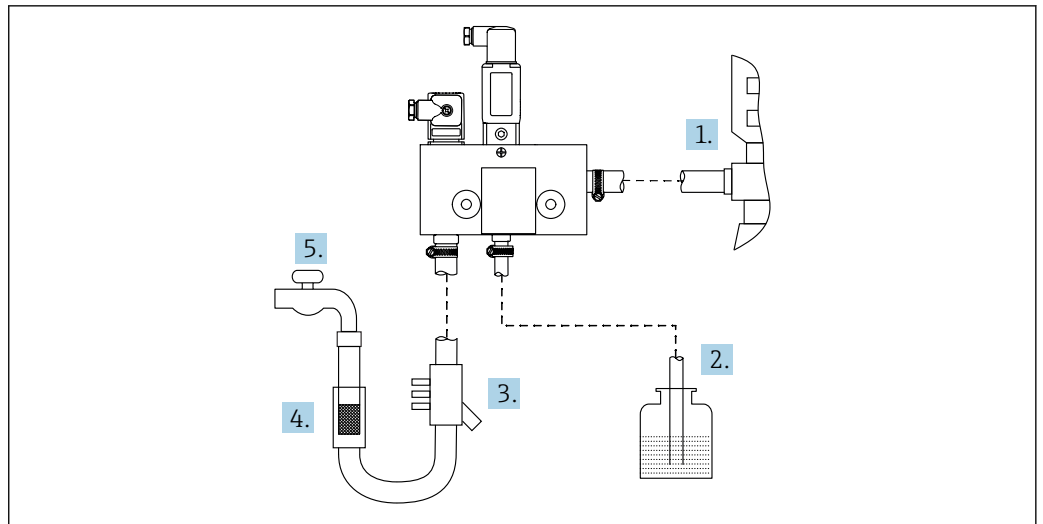
A0042415

1. Fit hose clips on hose ends.
2. Fit hoses on hose nozzles of device.
3. Tighten hose clips with a screwdriver.

**i** Pay attention to the hose nozzle diameter:

- Hose for cleaning mixture  
D 16 (G 3/8)
- Hose for cleaner  
D 12 (G 1/4)
- Hose for motive water  
D 16 (G 3/8)

#### Attaching process connections



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1. Connect hose for cleaning mixture to assembly.
2. Connect hose for cleaner to vessel for cleaner.  
↳ Place vessel for cleaner below the device.
3. Connect backflow valve to hose for motive water.
4. Connect dirt trap (pore size 0.25 mm (0.01 in)) to hose for motive water.
5. Connect hose for motive water to water supply.



An additional check valve is recommended at the assembly.

The hoses, backflow valve and dirt trap must be provided by the customer at the place of installation.

## Environment

**Ambient temperature range** -5 to +40 °C (+23 to +104 °F)

**Storage temperature range** -40 to +60 °C (-40 to +140 °F)

**Humidity** 0 to 95 %, non-condensating

**Operating altitude** <2000 m (6500 ft)

**Degree of protection** IP65

## Process

**Medium temperature** max. 60 °C (140 °F)

**Process pressure range**

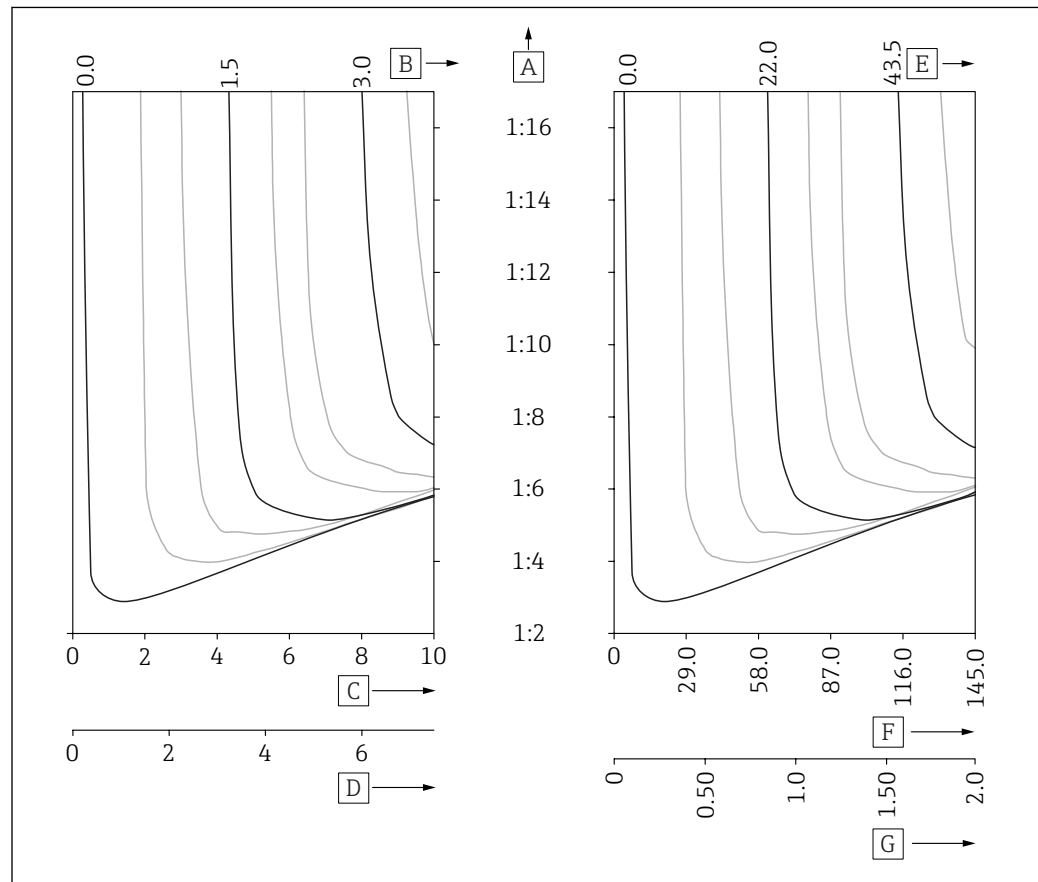
|                        |                             |
|------------------------|-----------------------------|
| Motive water pressure  | 2 to 10 bar (29 to 145 psi) |
| Medium counterpressure | max. 3 bar (43 psi)         |

**Suction height of cleaner** max. 3 m (9.8 ft)

**Mixture ratio** 1 : 4 to 1 : 17 (cleaner : motive water)

The mixture ratio of cleaner to water depends on several factors. The influence of these factors is shown in the following diagram.

**i** The characteristic curve represents an approximation only and is used to estimate the mixture ratio.



**5** Characteristic curve when metering valve is completely open

- A Mixture ratio cleaner : motive water
- B Medium counterpressure (in bar)
- C Motive water pressure (in bar)
- D Motive water flow rate (in l/min)
- E Medium counterpressure (in psi)
- F Motive water pressure (in psi)
- G Motive water flow rate (in US gpm)

**i** Application example:

When the medium counterpressure is 1.5 bar (22 psi) and the metering valve is completely open, a motive water pressure of 4 bar (58 psi) is required in order to configure a mixture ratio of cleaner : motive of 1 : 10.

**Motive water flow range** 2 to 10 l/min (0.53 to 2.64 gal/min)

**Motive water particle size**

|                               |          |
|-------------------------------|----------|
| Particle size in motive water | > 100 µm |
|-------------------------------|----------|

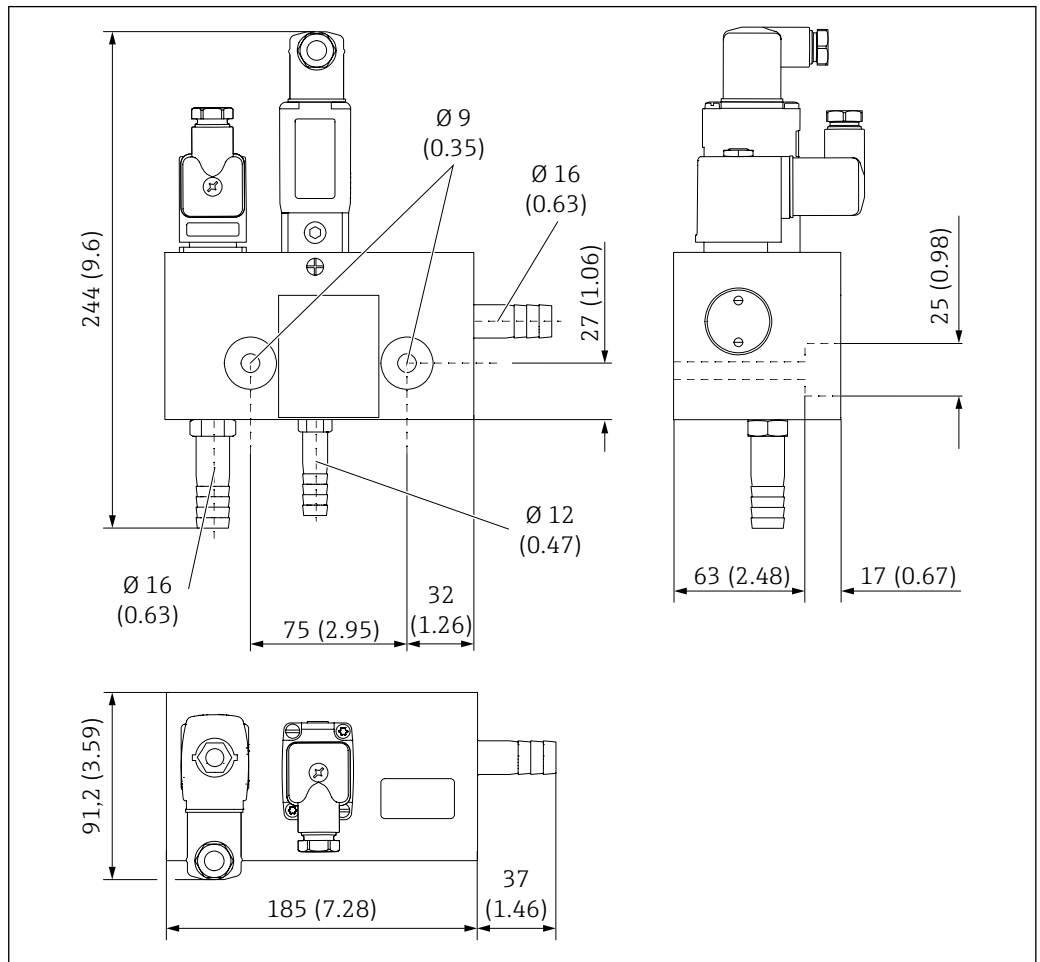
The use of a water filter for the motive water supply is recommended:

| Designation                          | Order number |
|--------------------------------------|--------------|
| Kit, water filter                    | 71390988     |
| Kit, filter element for water filter | 71390990     |



## Mechanical construction

### Dimensions



6 Dimensions in mm (in)

### Weight

2 kg (4.41 lb)

### Materials

|                 |                       |
|-----------------|-----------------------|
| Housing block   | PVC                   |
| Hose nozzles    | PVC                   |
| Valve head 6213 | EDPM, stainless steel |
| Valve head 0331 | EDPM, PP              |
| Seals           | EDPM, PTFE            |
| Check valve     | Glass                 |

### Hose specifications

| Hose between              | Maximum hose length | Maximum delivery head |
|---------------------------|---------------------|-----------------------|
| CYR10B and cleaner vessel | 3 m (9.8 ft)        | 3 m (9.8 ft)          |

## Certificates and approvals

### CE mark

The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EU directives. The manufacturer confirms successful testing of the product by affixing to it the **CE** mark.

## Ordering information

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**Product page**

[www.endress.com/CYR10B](http://www.endress.com/CYR10B)

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**Scope of delivery**

The delivery comprises:

- 1 CYR10B in the version ordered
- 1 Operating Instructions (DE)
- 1 Operating Instructions (EN)
- 1 Operating Instructions (FR)

## Accessories

The following are the most important accessories available at the time this documentation was issued.

- ▶ For accessories not listed here, please contact your Service or Sales Center.

### Cleanfit CPA472D

- Robust retractable assembly for pH, ORP and other industrial sensors
- Heavy-duty version made of durable materials
- For manual or pneumatic, remote-controlled operation
- Product Configurator on the product page: [www.endress.com/cpa472d](http://www.endress.com/cpa472d)

 Technical Information TI00403C

### Cleanfit CPA473

- Stainless steel process retractable assembly with ball valve shutoff for particularly reliable separation of the medium from the environment
- Product Configurator on the product page: [www.endress.com/cpa473](http://www.endress.com/cpa473)

 Technical Information TI00344C

### Cleanfit CPA474


- Plastic process retractable assembly with ball valve shutoff for particularly reliable separation of the medium from the environment
- Product Configurator on the product page: [www.endress.com/cpa474](http://www.endress.com/cpa474)

 Technical Information TI00345C

### Cleanfit CPA871

- Flexible process retractable assembly for water, wastewater and the chemical industry
- For applications with standard sensors with 12 mm diameter
- Product Configurator on the product page: [www.endress.com/cpa871](http://www.endress.com/cpa871)

 Technical Information TI01191C

 The CPA871 immersion chamber version is not supported because the counterpressure of the assembly is too high.

### Cleanfit CPA875

- Retractable process assembly for sterile and hygienic applications
- For in-line measurement with standard sensors with 12 mm diameter, e.g. for pH, ORP, oxygen
- Product Configurator on the product page: [www.endress.com/cpa875](http://www.endress.com/cpa875)

 Technical Information TI01168C

### Flexdip CYA112

- Immersion assembly for water and wastewater
- Modular assembly system for sensors in open basins, channels and tanks
- Material: PVC or stainless steel
- Product Configurator on the product page: [www.endress.com/cya112](http://www.endress.com/cya112)

 Technical Information TI00432C

### Flexdip CYH112

- Modular holder system for sensors and assemblies in open basins, channels and tanks
- For Flexdip CYA112 water and wastewater assemblies
- Can be affixed anywhere: on the ground, on the coping stone, on the wall or directly onto railings.
- Stainless steel version
- Product Configurator on the product page: [www.endress.com/cyh112](http://www.endress.com/cyh112)

 Technical Information TI00430C

## Supplementary documentation

 Operating Instructions BA01982

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

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