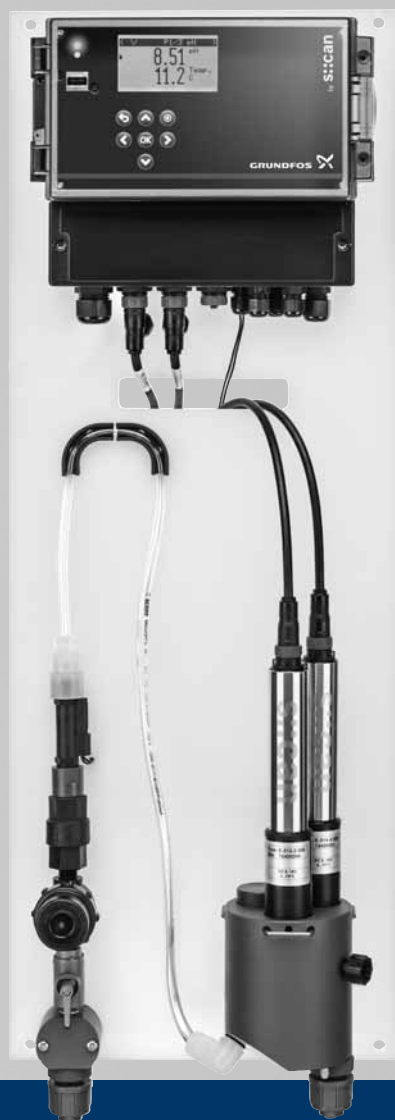


# DID

## Compact measuring systems, controllers, sensors and accessories

up to 3 parameters (Cl<sub>2</sub>, ClO<sub>2</sub>, H<sub>2</sub>O<sub>2</sub>, PAA, pH, ORP, conductivity)



<b>1. Product introduction</b>	<b>3</b>
General	3
Characteristics and main features	3
CU 382 control unit	3
Sensors	3
Pre-assembled measuring system	3
<b>2. Type key</b>	<b>4</b>
<b>3. Functions</b>	<b>5</b>
Components	5
Operating elements	6
CU 382 control unit	6
Software menu	7
<b>4. Installation schemes</b>	<b>8</b>
<b>5. Technical data</b>	<b>9</b>
CU 382-1 and CU 382-3 control unit	9
Sensors for disinfectants	10
Sensors for pH, ORP and conductivity	11
Hydraulic installation	12
Weights	12
<b>6. Dimensions</b>	<b>13</b>
DID with flow cell BF1	13
DID with flow cell BF3	13
DID for wall mounting and sensor with holder	14
<b>7. Product selection</b>	<b>15</b>
Standard range DID pre-assembled system	15
<b>8. Accessories and maintenance kits</b>	<b>16</b>
Accessories	16
Maintenance kits	17
<b>9. Grundfos Product Center</b>	<b>18</b>
Grundfos GO	19

# 1. Product introduction

## General

Monitoring of typical water quality parameters as well as precise control of disinfectant addition or pH adjustment is essential for many water treatment processes. Bus interface as well as data logging functionalities and intuitive user interface are a must for M&C today.

The new Grundfos by s::can DID systems are the perfect combination of s::can's state-of-the-art digital sensor technology and Grundfos' experience in PID controlling of dosing and disinfection processes. DID systems are designed to match perfectly with Grundfos dosing pumps, gas dosing systems as well as systems for the generation and dosing of chlorine dioxide and hypochlorite.

## Characteristics and main features

DID systems are available as pre-assembled systems with bypass flow cell or as kits for applications with tank-immersed sensors.

Variants with bypass flow cell are intended for monitoring and control of disinfectants, pH, ORP, conductivity and temperature. The water flow through the cell is kept at an appropriate level by a flow restrictor. Lack of water is detected by a flow switch and leads to an alarm. A shut-off ball valve and a sampling cock complete the hydraulic installation, which is compatible with Grundfos standard hoses.

System configurations for tank immersion are available with up to 2 sensors for pH, ORP and conductivity, and always include temperature measurement. These variants allow measurement of water parameters directly in the tank or basin without the need for a bypass line and flow cell. The control unit can either be fixed directly at a wall or back plate, or mounted on a DIN rail in a cabinet.

## CU 382 control unit

- Intuitive plain-text operation
- Data logger functionality
- Up to 3 controller outputs, freely assignable
- Modbus included
- Modbus sensor interface
- Data interchange with USB stick
- Wide-range power supply.

## Sensors

- Modbus interface to CU 382 control unit
- Onboard storage of calibration data
- Temperature compensation included for all sensors
- Long service intervals
- Pre-calibrated (pH, ORP, conductivity sensor)
- 1-2 sensor variants per parameter for all applications and measuring ranges
- Diaphragm-covered amperometric sensor principle for disinfectant sensors
- Low pH dependency for free-chlorine sensors.

## Pre-assembled measuring system

- Automatic setting of the water flow and detection of missing water flow in systems with flow cell
- Sensor holder included in systems for tank installation
- 25 ft. (7.5 m) of cable included in systems for tank installation (extension cables are available in lengths up to 66 ft. (20 m))
- Sensor guard included in systems for tank installation.

## 2. Type key

Example: DID-3 BF3-FCL2/TCL2/pH

	Code	Description
<b>CU 382 control unit variant</b>	DID-1	CU 382-1 for 1 parameter + temperature, 100-250 VAC, 50-60 Hz
	DID-3	CU 382-3 for 3 parameters + temperature, 100-250 VAC, 50-60 Hz
<b>Installation variant</b>	BF1	Bypass flow cell, 1 sensor
	BF3	Bypass flow cell, 3 sensors
	TI1	Tank immersion, 1 sensor
	TI2	Tank immersion, 2 sensors
<b>Parameters/sensors</b>	FCL2	Free chlorine, 0-2 ppm
	FCL20	Free chlorine, 0-20 ppm
	TCL2	Total chlorine, 0-2 ppm
	TCL20	Total chlorine, 0-20 ppm
	CDI2	Chlorine dioxide, 0-2 ppm
	CDI20	Chlorine dioxide, 0-20 ppm
	HP2	Hydrogen peroxide, 0-200 ppm
	HP20	Hydrogen peroxide, 0-2000 ppm
	PA2	Peracetic acid, 0-200 ppm
	PA20	Peracetic acid, 0-2000 ppm
	pH	pH 2-12, up to 145 psi (10 bar), 158 °F (70 °C)
	ORP	ORP, -2000 mV to +2000 mV, up to 145 psi (10 bar), 158 °F (70 °C)
	CND	Conductivity, 1-500000 µS/cm (2-42 PSU), up to 290 psi (20 bar), 158 °F (70 °C)

**Remarks:**

- All sensors include temperature measurement
- Measurement of disinfectant parameters (FCL,TCL, CDI, HP or PA) is only possible with BF1 or BF3 installation variant
- BF1 and BF3 installation variants include flow detection
- BF1 and BF3 installation variants include 3.28 ft. (1.0 m) sensor cable(s)
- TI1 and TI2 installation variants are only possible for parameters pH, ORP or CND
- TI1 and TI2 installation variants include 25 ft. (7.5 m) sensor cable(s)
- Mains cable is not included, please select part number 98661159 from accessories list and order separately.

### 3. Functions

#### Components

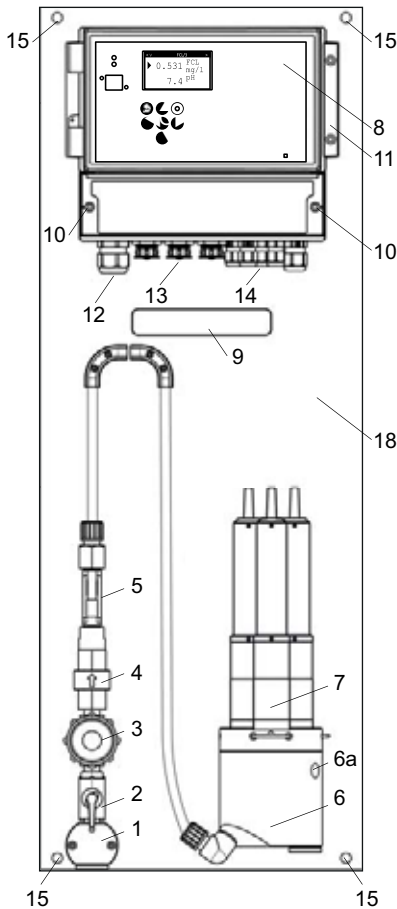


Fig. 1 Components of DID with flow cell

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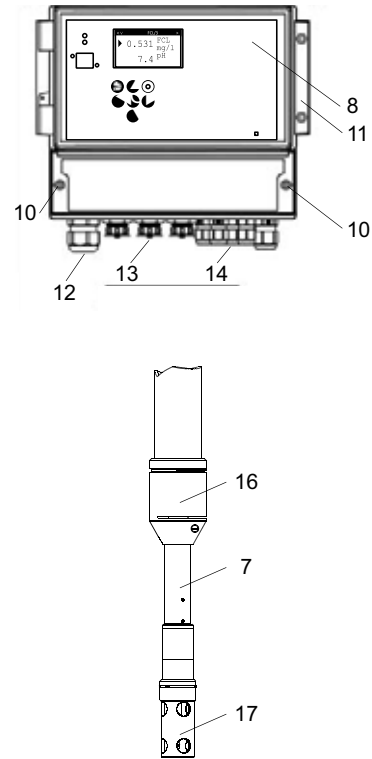


Fig. 2 Components of DID with immersed sensor

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Pos.	Description
1	Water inlet, G 1/2" internal thread and connections for Grundfos hoses
2	Ball valve, 1/4" NPT
3	Inlet strainer, with screw cap for removal and cleaning of the sieve
4	Flow restrictor, mechanical
5	Flow detector, digital. Sends an alarm to the CU 382 control unit, if the water flow falls below the minimal flow rate (approx. 0.07 gpm (0.25 L/min)).
6	Flow cell for 1 or 3 sensors. Includes an outlet with G 1/2" internal thread and connections for Grundfos hoses, and a sampling valve (6a).
7	Sensors
8	CU 382 control unit for 1 or 3 sensors
9	Opening in the back plate for the power supply cables and sensor cables
10	Screw joints to open the cable terminal compartment
11	Clip to open the housing cover
12	Cable gland for power supply
13	Connector for s::can sensors
14	Cable gland for signal outputs
15	Holes for wall-mounting
16	Sensor holder
17	Sensor guard
18	Back plate

## Operating elements

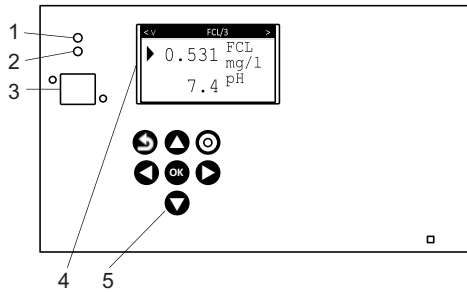









Fig. 3 Operating elements

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Pos.	Description
1	Power LED, green
2	Communication LED, orange <ul style="list-style-type: none"> <li>Flashes during communication with a sensor</li> </ul>
3	USB slot <ul style="list-style-type: none"> <li>For data export or firmware update</li> </ul>
4	Display
Operating buttons	
	 [Back] button <ul style="list-style-type: none"> <li>Exits the current menu</li> </ul>
	 [Up] button <ul style="list-style-type: none"> <li>Moves the marker to the line above               <ul style="list-style-type: none"> <li>The first character of the selected line is a triangle</li> </ul> </li> <li>Increases values</li> </ul>
	 [Function] button <ul style="list-style-type: none"> <li>Enters the setup menus</li> <li>Disables or deletes values</li> </ul>
5	 [Left] button <ul style="list-style-type: none"> <li>Moves the marker to the left</li> </ul>
	 [Ok] button <ul style="list-style-type: none"> <li>Enters the selected menu</li> <li>Confirms the selected line or value</li> <li>Acknowledges alarms</li> </ul>
	 [Right] button <ul style="list-style-type: none"> <li>Moves the marker to the right</li> </ul>
	 [Down] button <ul style="list-style-type: none"> <li>Moves the marker to the line below               <ul style="list-style-type: none"> <li>The first character of the selected line is a triangle</li> </ul> </li> <li>Decreases values</li> </ul>

## CU 382 control unit



Fig. 4 CU 382 control unit

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## Overview of features

Features	CU 382-1	CU 382-3
1 connector for digital s::can sensor	•	
3 connectors for digital s::can sensors		•
3 PID controllers	•	•
2 digital relay outputs, adjustable as controller outputs and/or limit switch outputs	•	•
3 analog outputs, adjustable as controller outputs and/or measured value outputs	•	•
1 alarm relay output	•	•
1 cleaning valve output	•	•
2 digital inputs, adjustable as remote on/off input, water meter pulse input or setpoint switch input	•	•
1 analog input, adjustable as flow meter input or external setpoint input	•	•
Data logger functionality (measured values, logfile, configuration)	•	•
USB host interface	•	•
Multilingual user interface	•	•
Modbus (via RS485)	•	•
1 input for flow switch of flow cell	•	•

## Software menu

### Status

Status >	
Version	V7.05B1
Serial:	9999999
Waiting:	1s
YYYY/MM/DD	h/min/sec



#### General setup

- ▶ Manage sensor
- Manage parameters
- Cleaning 1
- Measuring settings
- Date/Time
- Modbus slave
- Update software
- Select language
- Service

#### USB Data transfer



### Parameter

< v	P1/3 pH	>
▶	9.49	pH
	22.1	Temp. C



#### Parameter setup

- ▶ Calibrate expert
- Monitor
- Display settings
- Alarm settings
- Output
- Output settings
- pH compensation
- Parameter info
- Remove parameter

### Controller

< v	C2/2	>
	15 %	
Type	PID/Running	
pH	>4/20 mA #2	
	AV/SP: 6.86/7.00 (ext.)	



#### Controller setup

- ▶ Setpoint
- Settings PID/2-P/None
- Source
- Output DI/mA
- Output settings
- Alarm settings
- Reset state

### Alarm

<	AP001 A1/1
	YYYY/MM/DD
	Follow below
	Lower alarm limit

#### Alarm setup

- ▶ Acknowledgment of alarms

- ▶ Copy results
- Delete results
- Copy logfile
- Delete logs
- Update software...

## 4. Installation schemes

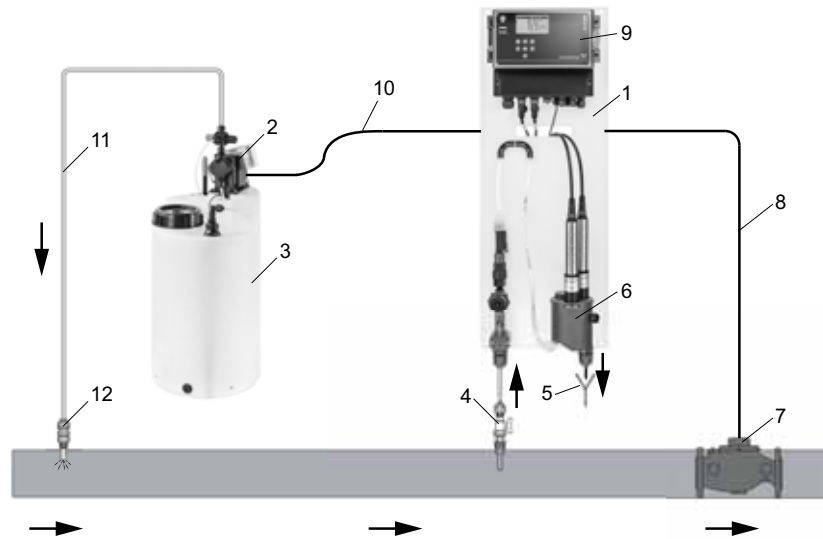


Fig. 5 Installation scheme of DID with bypass flow cell

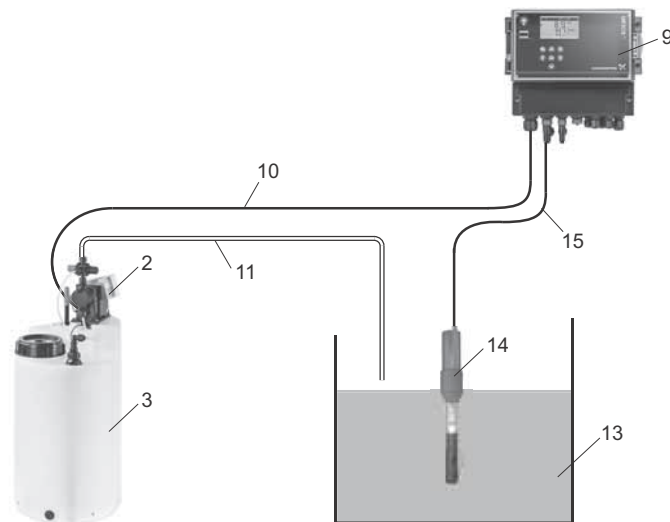


Fig. 6 Installation scheme of DID for tank immersion

### Legend

1	DID with bypass flow cell
2	SMART Digital dosing pump
3	Dosing tank
4	Sample water extraction
5	Sample water outlet to the drain
6	Bypass flow cell for 1 or 3 sensors
7	Flowmeter
8	Signal cable from flowmeter to CU 382 control unit
9	CU 382 control unit
10	Control cable to SMART Digital dosing pump
11	Dosing line
12	Injection unit
13	Tank
14	Sensor holder
15	Signal cable from sensor to CU 382 control unit

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## 5. Technical data

### CU 382-1 and CU 382-3 control unit

Data		CU 382-1	CU 382-3	
General data	Number of sensor connectors (Buccaneer 400 series)	1	3	
	Number of analog inputs (4-2000 mA)		1	
	Number of digital inputs		2	
	Number of analog outputs (4-20 mA)		3	
	Number of digital outputs NO relays		2	
	Number of digital outputs NO/NC relays (alarm relays)		1	
	Number of USB ports (host)		1	
	Number of RS485 ports (Modbus slave)		1	
	Number of M20 cable gland entries (mains)		1	
	Number of M16 cable gland entries		1	
	Number of M12 cable gland entries		4 <sup>1)</sup>	
	Memory (industrial grade SLC)	[MB]		512
	Ambient temperature	[°F (°C)]	-4 to 113 °F (-20 to 45 °C)	
	Humidity (non condensing)	[%]		5 to 90
	Electrical data <sup>2)</sup>	Voltage	[V]	100-240
Frequency		[Hz]	50-60	
Power consumption		[W]	33	
Max. inrush current		[A]	< 30	
Enclosure class			IP65	
Signal input, analog 4-20 mA	Input resistance	[Ohm]	100	
	Galvanic isolation (to system ground/earth)	[kV]	1	
	Resolution	[bit]	12	
Signal input, digital	Standard setup (for connection with mechanical relay/switch)			
	• Max. input frequency	[Hz]	100	
	• Low input voltage	[V]	< 7	
	• High input voltage	[V]	> 8	
	• Input resistance	[Ohm]	> 1000	
	Optional setup (for connection with external voltage output)			
	• Max. input frequency	[Hz]	100	
	• Low input	[Ohm]	< 100	
	• High input	[Ohm]	> 2000	
	• Galvanic isolation (to system ground/earth)	[kV]	1	
Signal output, analog 4-20 mA	Maximum load resistance	[Ohm]	500	
	Galvanic isolation (to system ground/earth)	[kV]	1	
	Resolution	[bit]	12	
Signal output, digital with relays <sup>3)</sup>	Maximum working voltage	[VAC]	250	
	Maximum switchable load	[A]	6	
	Maximum load	[VA]	600	
Weight	[lbs. (kg)]	3 (1.3)		
Approvals		CE, CSA, cTUVus, (RCM)		

<sup>1)</sup> One of the cable glands is used for the flow switch (DID with bypass flow cell).

<sup>2)</sup> Remark: a circuit breaker must be installed.

<sup>3)</sup> Remark: depending on the load, additional snubber circuits might be required.

## Sensors for disinfectants

		Chlori::lyser				Chlodi::lyser		Hyper::lyser		Peroxy::lyser		
		Free chlorine		Total chlorine		Chlorine dioxide		Hydrogen peroxide		Peracetic acid		
General data	Measuring range	ppm [mg/l]	0-2	0-20	0-2	0-20	0-2	0-20	0-200	0-2000	0-200	0-2000
	Accuracy	[%]	< 1 <sup>1)</sup>	< 1 <sup>2)</sup>	< 1 <sup>1)</sup>	< 1 <sup>2)</sup>	< 1 <sup>1)</sup>	< 1 <sup>2)</sup>	< 2 <sup>3)</sup>	< 0.5 <sup>4)</sup>	< 2 <sup>3)</sup>	< 0.5 <sup>4)</sup>
	Resolution	ppm [mg/l]	0.001	0.01	0.001	0.01	0.001	0.01	0.1	1	0.1	1
	Measuring principle	-	Amperometric, 3 electrodes, membrane-covered				Amperometric, 2 electrodes, membrane-covered					
	Temperature compensation	-	Yes		Yes		Yes		Yes		Yes	
	pH compensation	-	Yes		Yes		-		-		-	
	Response time (T90)	minute	2		2		1		8		41 at 50 °F (5 at 10 °C) 34.7 at 122 °F (1.5 at 50 °C)	
	Run-in time (during startup, after power-off)	hour	2		2		1		3		3	
	Operating temperature (liquid temperature)	[°F (°C)]	41-113 °F (5-45 °C)		41-113 °F (5-45 °C)		41-122 °F (5-50 °C)		41-113 °F (5-45 °C)		41-113 °F (5-45 °C)	
	Max. pressure (on outlet, without pressure peaks or fluctuation)	[psi (bar)]	7.25 (0.5)		7.25 (0.5)		14.5 (1)		14.5 (1)		14.5 (1)	
Recommended flow (DID with flow cell)	[g/h (l/h)]	8 (30)		8 (30)		8 (30)		8 (30)		8-26 (30-100)		
Recommended flow speed (DID for tank immersion)	[m/s]	0.015 - 0.06		0.015 - 0.06		0.015 - 0.06		0.015 - 0.06		0.015 - 0.06		
pH operating range	[pH]	4-9		4-12		2-11		2-11		1-6		
Cross sensitivities	Influence of pH on reading	-	Up to pH 7: no influence Up to pH 9: 10 % of electrode slope		Between pH 4 and 12: 5 % of electrode slope per pH unit		No influence		No influence		No influence	
	Influence of ClO <sub>2</sub> : Reading instead of parameter	[%]	75		75		-		n/A		100	
	Influence of Cl <sub>2</sub> : Reading instead of parameter	[%]	-		-		0		Must not be present		0	
	Influence of O <sub>3</sub> : Reading instead of parameter	[%]	80		130		2500		Must not be present		2500	
	Influence of other substances	-	Combined chlorine can increase reading		-		-		PES or PAA must not be present. Sulfide and phenole poison or destroy the membrane system.		No influence of H <sub>2</sub> O <sub>2</sub>	
Material and design	Enclosure class	-	IP67		IP67		IP67		IP67		IP67	
	Housing materials	-	PVC-U, PEEK SS 1.4571		PVC-U, PEEK SS 1.4571		PVC-U SS 1.4571		PVC-U SS 1.4571		PVC-U SS 1.4571	
Storage data	Storage temperature of sensor	[°F (°C)]	32-113 °F (0-45 °C)									
	Storage temperature of electrolyte	[°F (°C)]	50-95 °F (10-35 °C)									
	Storage conditions	-	Dry, without electrolyte, with clean membrane cap									
	Max. storage time of electrolyte	years	1-2 (check expiry date on package)									
Approvals	-	CE (EN 61326-1:2013)										

1) at 0.4 ppm and at 1.6 ppm

2) at 1.5 ppm

3) at 40 ppm and at 160 ppm

4) at 40 ppm and < 2 % at 1600 ppm

## Sensors for pH, ORP and conductivity

		pH::lyser pH	Redo::lyser ORP	Condu::lyser Conductivity
General data	Measuring principle	-	Potentiometric, with combined non-porous reference electrode	4-electrode, direct contact
	Measuring range of main parameter	-	pH 2-12	-2000 to +2000 mV
	Measuring range of temperature	[°F (°C)]	32-158 °F (0-70 °C)	32-158 °F (0-70 °C)
	Temperature compensation	-	Yes, with PT100 (class B)	no
	Resolution of main parameter	-	pH 0.01	1 mV
	Resolution of temperature	[°F (°C)]	32.18 °F (0.1 °C)	32.18 °F (0.1 °C)
	Accuracy	-	± 0.1 pH	± 10 mV in standard solution
	Response time (T90)	[s]	30	30
	Run-in time (during startup)	hour	< 1	
Ambient conditions	Operating temperature	[°F (°C)]	32-158 °F (0-70 °C)	
	Operating pressure range	[psi (bar)]	0-145 (0-10)	
	Recommended range flow speed (submersed installation)	[m/s]	0.01-3	
Material and design	Enclosure class (sensors with plug)	-	IP67	
	Enclosure class (sensors with cable)	-	IP68	
	Housing materials	-	Stainless steel 1.4571, POM-C	
	Sensor materials	-	-	-
Storage data	Storage temperature of sensor	[°F (°C)]	32-194 °F (0-90 °C)	
	Storage time	-	Approx. one year with filled protective cap (check expiry date on package)	
Approvals	-	CE (EN 61326-1:2013)		

## Hydraulic installation

### BF1 and BF3 variants with bypass flow cell

Data	Units	BF1	BF3
General data	Number of connectable S::CAN sensors	1	3
	Min. liquid temperature*	[°F (°C)]	32.18 °F (0.1 °C)
	Max. liquid temperature*	[°F (°C)]	113 °F (45 °C)
	Min. ambient temperature*	[°F (°C)]	32.18 °F (0.1 °C)
	Max. ambient temperature*	[°F (°C)]	113 °F (45 °C)
Hydraulic data	Min. flow rate	[g/h (l/h)]	8 (30)
	Max. flow rate (integrated limitation)	[g/h (l/h)]	16 (60)
	Max. pressure at inlet	[psi (bar)]	44 (3)
	Min. pressure at inlet	[psi (bar)]	7.25 (0.5)
	Max. pressure at outlet (non fluctuating)	[psi (bar)]	7.25 (0.5)
Connection data	Inlet/outlet: internal thread	["]	Rp1/2
	Inlet/outlet: threaded connection size	-	G 5/8
	Inlet/outlet: hose connections, metric (ID/OD)	[mm]	4/6, 6/9, 6/12 or 9/12
	Inlet/outlet: hose connections, inch (IDxOD)	["]	0.17 x 1/4, 1/4 x 3/8 or 3/8 x 1/2
	Sample water outlet: hose barb	[ft. (mm)]	0.01 (4)

\* Check data of sensor and CU 382 control unit, too. The lowest value defines the actual operating limits.

### TI1 and TI2 variants for tank immersion

Data	Units	TI1	TI2
General data	Number of connectable S::CAN sensors	1	2
	Min. liquid temperature*	[°F (°C)]	32 °F (0.1 °C)
	Max. liquid temperature*	[°F (°C)]	113 °F (45 °C)
	Min. ambient temperature*	[°F (°C)]	32 °F (0.1 °C)
	Max. ambient temperature*	[°F (°C)]	113 °F (45 °C)
Hydraulic data	Max. flow speed*	[m/s]	See sensor data
	Max. pressure*	[psi (bar)]	145 (10)
Connection data	Prepared for metric pipe dimension (OD)	[in. (mm)]	2 (50)
	Prepared for inch pipe dimension (OD)	["]	2

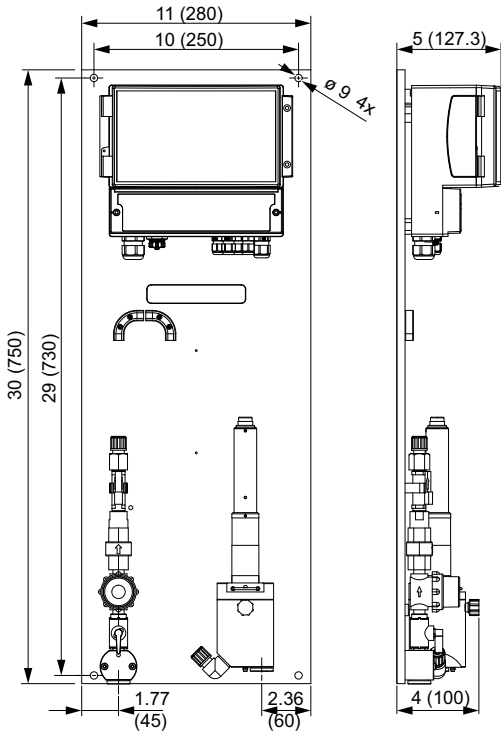
\* Check data of sensor and CU 382 control unit, too. The lowest value defines the actual operating limits.

## Weights

Description	Without packaging	With packaging	Product number
	[lbs. (kg)]	[lbs. (kg)]	
DID-1 BF1-FCL2	9 (4.26)	18 (8.10)	98915656
DID-1 BF1-CDI2	9 (4.26)	18 (8.10)	98915657
DID-1 BF1-PA2	9 (4.26)	18 (8.10)	98915658
DID-1 BF1-HP2	9 (4.26)	18 (8.10)	98915659
DID-3 BF3-FCL2/TCL2	10 (4.72)	19 (8.78)	98915660
DID-3 BF3-FCL2/PH	10 (4.71)	19 (8.77)	98915661
DID-3 BF3-FCL2/TCL2/PH	11 (4.97)	20 (9.18)	98915662
DID-3 BF3-FCL2/ORP	10 (4.71)	19 (8.77)	98915663
DID-3 BF3-FCL2/PH/ORP	11 (4.96)	20 (9.17)	98915664
DID-1 BF1-PH	9 (4.25)	18 (8.09)	98915665
DID-1 TI1-PH	5 (2.08)	13 (5.88)	98915666
DID-1 TI1-ORP	5 (2.08)	13 (5.88)	98915667
DID-3 TI2-ORP/PH	6 (2.85)	15 (6.80)	98915668
DID-3 BF3-ORP/PH	10 (4.70)	19 (8.76)	98915669
DID-1 BF1-CND	9 (4.25)	18 (8.09)	98915670
DID-1 TI1-CND	5 (2.08)	13 (5.88)	98915671

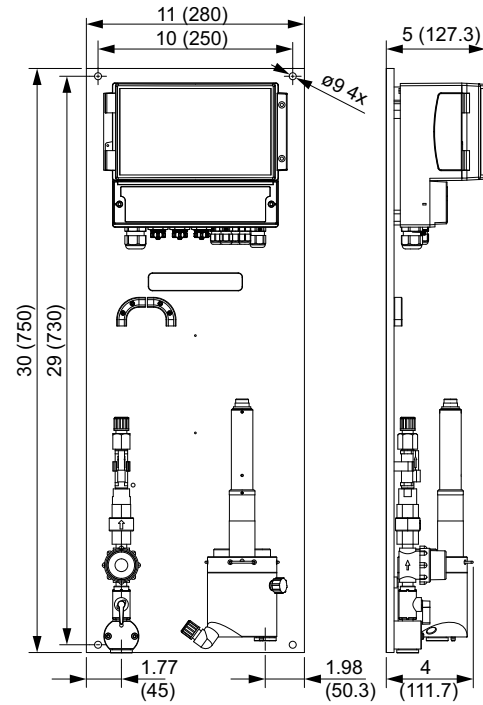
## 6. Dimensions

### DID with flow cell BF1

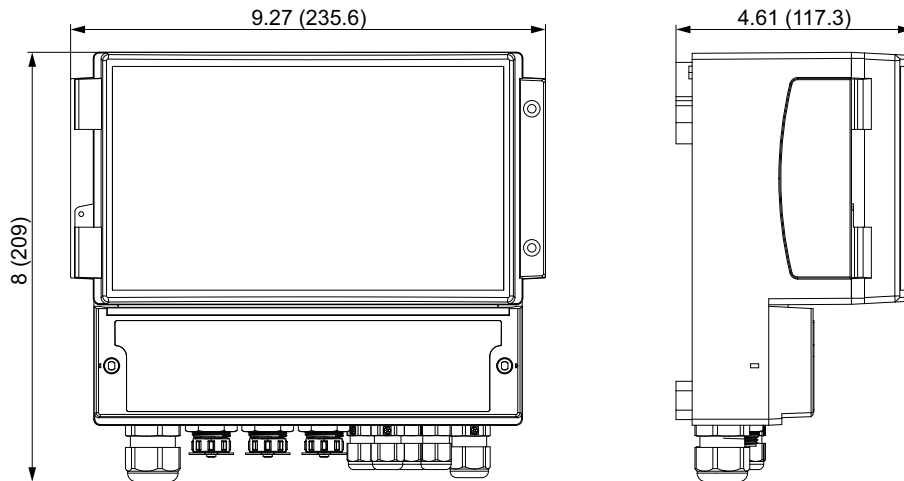


**Fig. 7** Dimensions of DID with flow cell, GF1 installation variant, for 1 sensor [in (mm)]

### DID with flow cell BF3

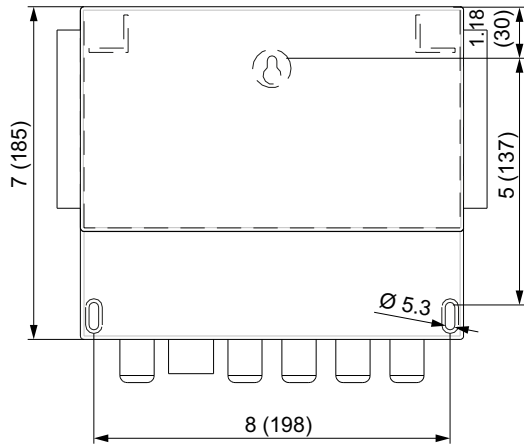


**Fig. 8** Dimensions of DID with flow cell, BF3 installation variant, for up to 3 sensors [in (mm)]



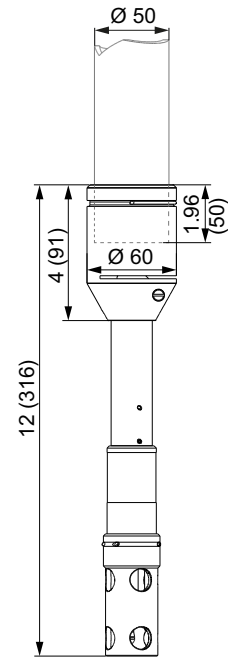
**Fig. 9** Dimensions of CU 382 control unit, front and side view [in (mm)]

## DID for wall mounting and sensor with holder



**Fig. 10** Dimensions of CU 382 control unit for wall mounting, back [in (mm)]

TM06 7522 0916



**Fig. 11** Dimensions of sensor with holder [in (mm)], pipe with outside diameter 1.96 in. (50 mm) not included

TM06 7523 0916

## 7. Product selection

### Standard range DID pre-assembled system

#### DID with bypass flow cell, with flow switch

Purpose/applications	Parameter 1	Parameter 2	Parameter 3	Type key	Product number
Free chlorine dosing control <sup>1)</sup>	Free chlorine 0-2 ppm			DID-1 BF1-FCL2	98915656
ClO <sub>2</sub> dosing control	Chlorine dioxide 0-2 ppm			DID-1 BF1-CDI2	98915657
PAA dosing control	Peracetic acid 0-200 ppm			DID-1 BF1-PA2	98915658
H <sub>2</sub> O <sub>2</sub> dosing control	Hydrogen peroxide 0-200 ppm			DID-1 BF1-HP2	98915659
Chloramine dosing control or chlorine dosing control with monitoring of total chlorine	Free chlorine 0-2 ppm	Total chlorine 0-2 ppm		DID-3 BF3-FCL2/TCL2	98915660
Free chlorine dosing control + pH control <sup>2)</sup>	Free chlorine 0-2 ppm	pH 2-12		DID-3 BF3-FCL2/PH	98915661
Chloramine dosing control or chlorine dosing control with monitoring of total chlorine + pH control <sup>2)</sup>	Free chlorine 0-2 ppm	Total chlorine 0-2 ppm	pH 2-12	DID-3 BF3-FCL2/TCL2/PH	98915662
Free chlorine dosing control with validation via ORP <sup>1)</sup>	Free chlorine 0-2 ppm	ORP -2000 to +2000 mV		DID-3 BF3-FCL2/ORP	98915663
Free chlorine dosing control with validation via ORP + pH control <sup>2)</sup>	Free chlorine 0-2 ppm	pH 2-12	ORP -2000 to +2000 mV	DID-3 BF3-FCL2/PH/ORP	98915664
pH control (neutralization, pH adjustment for further processes), dosing control of acids and bases	pH 2-12			DID-1 BF1-PH	98915665
Dosing control in oxidation/reduction processes (e.g. removal of chromic acid, nitrite or cyanide)	ORP -2000 to +2000 mV	pH 2-12		DID-3 BF3-ORP/PH	98915669
Chemical dosing control in CIP-processes, high-purity water, cooling towers	Conductivity 1-500000 µS/cm			DID-1 BF1-CND	98915670
Without sensors, allows customization according to specific application requirements, up to 3 sensors are possible				DID-3 BF3	99083725

<sup>1)</sup> With internal pH compensation up to pH 8.5

<sup>2)</sup> Provides additional pH compensation of chlorine measurement for highest accuracy

#### DID for tank immersion

Purpose/applications	Parameter 1	Parameter 2	Type key	Product number
pH control (neutralization for further processes), dosing control of acids and bases	pH 2-12		DID-1 TI1-PH	98915666
Denitrification, monitoring of the disinfection effect when dosing oxidizing agents, etc.	ORP -2000 to +2000 mV		DID-1 TI1-ORP	98915667
Dosing control in oxidation/reduction processes (e.g. removal of chromic acid, nitrite or cyanide)	ORP -2000 to +2000 mV	pH 2-12	DID-3 TI2-ORP/PH	98915668
Chemical dosing control in CIP-processes, high-purity water, cooling towers	Conductivity 1-500000 µS/cm		DID-1 TI1-CND	98915671

## 8. Accessories and maintenance kits

### Accessories

#### Mains cables

Cable length: 8 ft. (2.43 m)

Plug type	Product number
USA	98661159

#### Sensor cables

- Connection of sensor and control unit
- Extension to bridge long distances between sensor and control unit

Use	Cable length [ft. (m)]	Product number
DID with flow cell: cable for connection of sensor and control unit	3.3 (1)	98915690
DID with flow cell and DID for tank immersion: extension cable for long distance connection of sensor and control unit	33 (10)	98915691
	66 (20)	98915692

#### Sensors

Individual sensors for customized solutions or add-on to standard systems. All sensors include temperature measurement in addition to the main parameter.

##### DID with flow cell

- Sensors with plug

Parameter	Measuring range	Product number
Free chlorine (FCI)	0-2 ppm	98915674
	0-20 ppm	98915675
Total chlorine (TCI)	0-2 ppm	98915676
	0-20 ppm	98915677
Chlorine dioxide (CDI)	0-2 ppm	98915678
	0-20 ppm	98915679
Hydrogen peroxide (HP)	0-200 ppm	98915680
	0-2000 ppm	98915681
Peracetic acid (PA)	0-200 ppm	98915682
	0-2000 ppm	98915683
pH	pH 2-12	98915684
ORP	-2000 mV to +2000 mV	98915686
Conductivity (CND)	1-500000 µS/cm (2-42 PSU)	98915688

##### DID for tank immersion

- Sensors with 25 ft. (7.5 m) of fixed cable

Parameter	Measuring range	Product number
pH	pH 2-12	98915685
ORP	-2000 mV to +2000 mV	98915687
Conductivity (CND)	1-500000 µS/cm (2-42 PSU)	98915689

#### CU 382 control unit

Individual control units for customized solutions or as a replacement.

Control unit type	Number of sensor connectors	Product number
CU 382-1	1	98915672
CU 382-3	3	98915673

#### Hydraulic installation components

Installation type	Components	Product number
DID with bypass flow cell	Inlet connection, shut-off valve, strainer, flow restrictor, flow switch, connecting hose	99074484
	Flow cell for 1 sensor, sampling cock and outlet, outlet connection	99074485
	Flow cell for 3 sensors, sampling cock and outlet, outlet connection	99074486
DID for tank immersion	Sensor holder	99074490
	Sensor guard	99074487
	Cleaning valve (for use with a compressed-air installation)	99074488
	Cleaning assembly with valve and compressor (if no compressed air is available on site)	99074489

#### Anti-siphoning pressure-loading valve

Mounted on the outlet connection of DID with bypass flow cell.

Prevents siphoning in case the outlet to the drain is far below the DID system.

Description	Product number
Pressure loading valve to prevent siphoning	96609179



## KCl solution for safe storage of pH and ORP sensors

The tips of ORP and pH sensors must be wetted with 3-molar potassium chloride (KCl) solution during storage.

Description	Product number
Bottle of KCl solution for safe storage of pH and ORP sensors, 8.45 fl. oz. (250 ml)	96688696

## Buffer solution kit for pH sensor calibration

The buffer solution kit includes three buffer solutions with pH 4.01, pH 7 and pH 9.18.

Description	Product number
Buffer solution kit, 3 x 3.38 fl. oz. (3 x 100 ml)	96609165

## Maintenance kits

### Maintenance kits for disinfectant sensors

Maintenance kits for disinfectant sensors include a bottle of electrolyte and a membrane cap.

When used under normal conditions with ordinary water, a sensor can be operated for one year with a maintenance kit.

The electrolyte must be exchanged twice a year, the membrane cap once a year.

Maintenance kit for parameter	Product number
Free chlorine (FCI)	99074494
Total chlorine (TCI)	99074495
Chlorine dioxide (CDI)	99074496
Hydrogen peroxide (HP)	99074497
Peracetic acid (PA)	99074498

### Maintenance kits for pH and ORP sensors

Maintenance kits for pH and ORP sensors include an electrode to replace the one included in the sensor.

Depending on the water quality, the electrode must be replaced after 1-3 years.

Maintenance kit for parameter	Product number
pH	99074499
ORP	99074500

## 9. Grundfos Product Center

Online search and sizing tool to help you make the right choice.

<http://product-selection.grundfos.com>



"SIZING" enables you to size a pump based on entered data and selection choices.

"REPLACEMENT" enables you to find a replacement product. Search results will include information on

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.

The screenshot shows the Grundfos Product Center website. At the top, there is a navigation bar with the logo and 'PRODUCT CENTER'. Below it is a search bar with a 'SEARCH' button. The main content area features four large buttons: 'SIZING' (with a subtext 'Enter pump sizing'), 'CATALOG' (with a subtext 'Product and services'), 'REPLACEMENT' (with a subtext 'Replace an old pump with a new'), and 'LIQUIDS' (with a subtext 'Find liquid pump'). Below these buttons is a 'QUICK SIZING' section with input fields for 'Flow (Q)\*' and 'Head (H)\*', and a 'Select what to size by:' section with radio buttons for 'Size by application', 'Size by pump design', and 'Size by pump family'. A 'START SIZING' button is located to the right of the 'QUICK SIZING' section. At the bottom of the 'QUICK SIZING' section, there are links for 'ADVANCED SIZING' with options for 'Advanced sizing by application' and 'Guided selection'.

"CATALOG" gives you access to the Grundfos product catalog.

"LIQUIDS" enables you to find pumps designed for aggressive, flammable or other special liquids.

### All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items — including complete projects — right on the main page.

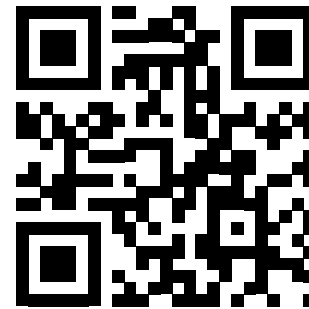
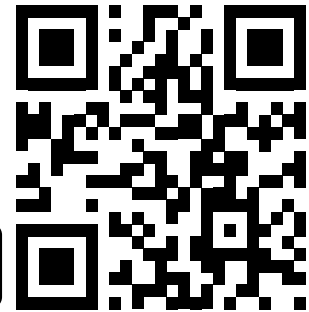
### Downloads

On the product pages, you can download Installation and Operating Instructions, Data Booklets, Service Instructions, etc. in PDF format.

## Grundfos GO

### Mobile solution for professionals on the GO!

Grundfos GO is the mobile tool box for professional users on the go. It is the most comprehensive platform for mobile pump control and pump selection including sizing, replacement and documentation. It offers intuitive, handheld assistance and access to Grundfos online tools, and it saves valuable time for reporting and data collection.



Subject to alterations.

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