

Hydraulic installation, wiring and software settings overview for some typical installations

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1 Disinfectant +pH measurement and control, basic

1.1 Overview

→DID3-BF3-FCI/PH

→Control of dosing pumps for Hypochlorite (mA) and acid (mA)

→No output of measured values

→Alarm relay connected

→No additional external inputs

1.2 Installation options

	<p>Waterline:</p> <ul style="list-style-type: none"> 1 DID system 2 Dosing pump 3 Chemical tank (i.e. DTS) 4 Measuring water withdrawal 5 Outlet of measuring water to drain 6 Flow cell with sensors 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit <p>Water flow direction</p>
	<p>Circulatory system:</p> <ul style="list-style-type: none"> 1 DID system 2 Dosing pump 3 Chemical tank (i.e. DTS) 4 Measuring water withdrawal 5 Outlet of measuring water to drain 6 Flow cell with sensors 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 Breaker tank 14 Feedback line for measuring water, prohibited for drinking water in some countries, observe local regulations! 15 Circulation pump 16 Other system parts <p>→ Water flow direction</p>
	<p>Batch basin or tank:</p> <ul style="list-style-type: none"> 1 DID system 2 Dosing pump 3 Chemical tank (i.e. DTS) 4 Measuring water withdrawal 5 Outlet of measuring water to drain 6 Flow cell with sensors 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 Breaker tank 14 Feedback line for measuring water 15 Measuring water pump

1.3 Wiring:

Terminal no.	description	Cable entry	Comments
1	Phase	M20	Power supply, observe local regulations For details see chapter 7.1
2	Neutral		
3	PE		
13	4-20mA-output #1 (+)	M12 #2	Hypo pump for details see chapter 7.3.1
14	4-20mA-output #1 (-)		
17	4-20mA-output #2 (+)	M12 #3	Acid pump for details see chapter 7.3.1
18	4-20mA-output #2 (-)		
31	Flow #1, Flow switch of flow cell, pre-wired in BF1/BF3	M12 #1	No interaction required as pre-wired
32	Flow #1, Flow switch of flow cell, pre-wired in BF1/BF3		
51	Alarm relay NO , Relay closes on alarm	M16	Alarm to upper system controls, use terminal 52 and 51 OR 53
52	Alarm relay C , common connector		
53	Alarm relay NC , Relay opens on alarm		

1.4 Software settings

Screen	Subscreen1	Subscreen2	Setting	Value		
Status	Manage sensors	Add sensor	Add Modbus sensor	Chlori::lyser/0/1		
				Ise::/Ph::lyser/0/2		
			Add digital in	Add flow switch		
			Chlori::lyser/0/1	Add parameters	Add FCL	
			Ise::/Ph::lyser/0/2	Add parameters	Add pH	
					Add Temp.	
			Flow switch	Add parameters	Add flow	
				Configure	Type	State
					Invert pol	No
			Meas.settings	Interval (s)		5
		Date time	Year:		YYYY (i.e. 2016)	
			Month:		MMM (i.e. Jan)	
			Day:		DD (i.e. 8)	
			Hour:		HH (i.e. 12)	
			Minute:		mm (i.e. 43)	
	Select language	English		Select with OK		
		Deutsch				
		Francais				
Parameter	FCl (Free chlorine)	Display settings	Name	FCl		
			Unit:	mg/l		
			Disp. Format:	2		
		Alarm settings	Require ack.	No		
			Al.lower	None (or desired value)		
			Al.Higher	0,9 (or desired value)		
		Output		None		
		pH compensation	Type	Auto		
			Source	pH		
		pH	Display settings	Name	pH	
	Unit:			-		
	Disp. Format:			2		
	Alarm settings		Require ack.	No		
			Al.lower	4 (or desired value)		
			Al.Higher	10 (or desired value)		
	Output			None		
	Temperature	Display settings	Name	Temp		
			Unit:	°C		
			Disp. Format:	1		
		Alarm settings	Require ack.	No		
			Al.lower	None (or desired value)		
			Al.Higher	45 (or desired value)		
		Output		None		
	Flow	Display settings	Name	Flow		
Unit:			-			

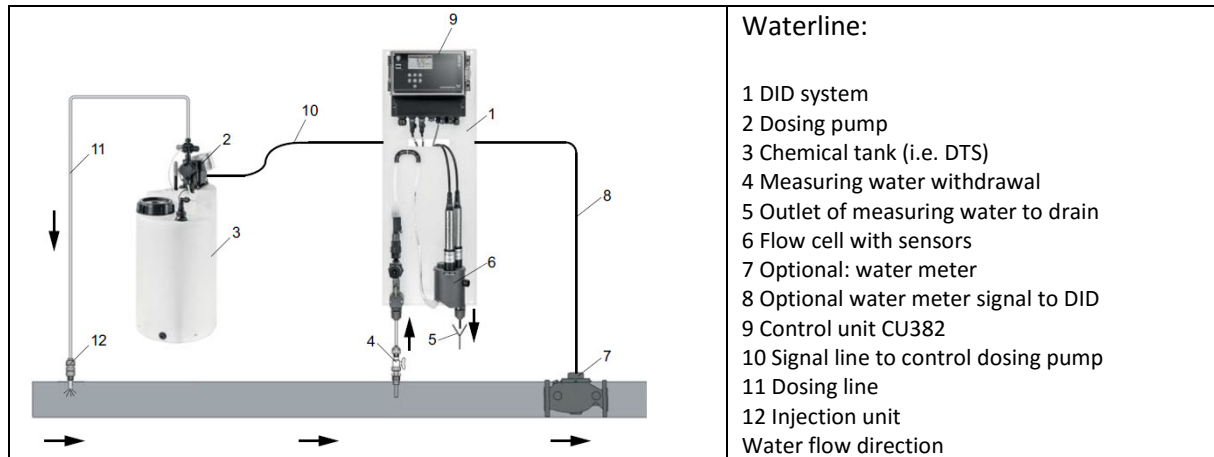
			Disp. Format:	0
		Alarm settings	Require ack.	No
			Al.lower	0
		Output		None
Controller	C1/FCI1	Setpoint	Type	Manual
			Setpoint	0,3 (or desired value)
		Settings PID	Type	PID
			Kp (%)	40 (starting value)
			Ti (s)	200 (measure in system)
			Td (s)	0
			Stop on error	Yes
			Max. 100% (s)	180 (starting value)
			Disturb:	none
			Direction	up
		Dead band	0,0	
		Source		FCI
		Output		4/20mA #1
		Alarm sources...	FCI	upper
	Flow		lower	
	C2/PH	Setpoint	Type	Manual
			Setpoint	7 (or desired value)
		Settings PID	Type	PID
			Kp (%)	40 (starting value)
			Ti (s)	200 (measure in system)
			Td (s)	0
			Stop on error	Yes
			Max. 100% (s)	180 (starting value)
			Disturb:	none
			Direction	down
		Dead band	0,0	
		Source		pH
Output		4/20mA #2		
Alarm sources...	pH	lower		
	Flow	lower		

2 Disinfectant +pH meas. and control, +external setpoint (mA) and watermeter (pulse)

2.1 Overview

- DID3-BF3-FCl/PH
- Control of dosing pumps for Hypochlorite (mA) and acid (pulse)
- Output of measured values (free chlorine and pH)
- Alarm relay connected
- Water meter (pulse)
- Setpoint from upper controls (mA)

2.2 Installation options



2.3 Wiring:

Terminal no.	description	Cable entry	Comment
1	Phase	M20	Power supply, observe local regulations For details see chapter 7.1
2	Neutral		
3	PE		
13	4-20mA-output #1 (+)	M12 #2	Hypo pump for details see chapter 7.3.1
14	4-20mA-output #1 (-)		
17	4-20mA-output #2 (+)	M16	Output of measured value of FCl to upper system control
18	4-20mA-output #2 (-)		
21	4-20mA-output #3 (+)	M16	Output of measured value pH to upper system control
22	4-20mA-output #3 (-)		
24	4-20mA-input #1 (-)	M16	Setpoint input from upper system control
25	4-20mA-input #1 (+)		
27	Digital input#1 (+), relay to switch on/off or as pulse source	M12 #4	Input from watermeter with pulse output
28	Digital input#1 (-)		
31	Flow #1, Flow switch of flow cell, pre-wired in BF1/BF3	M12 #1	No interaction required as pre-wired
32	Flow #1, Flow switch of flow cell, pre-wired in BF1/BF3		
47	Relay 1-NO, switches on/off or provides pulse frequency	M12 #3	Acid pump for details see chapter 7.3.2
48	Relay 1-C,		
51	Alarm relay NO, Relay closes on alarm	M16	Alarm to upper system controls, use terminal 52 and 51 OR 53
52	Alarm relay C, common connector		
53	Alarm relay NC, Relay opens on alarm		

2.4 Software settings

Screen	Subscreen1	Subscreen2	Setting	Value
Status	Manage sensors	Add sensor	Add Modbus sensor	Chlori::lyser/0/1
				Ise::Ph::lyser/0/2
			Add digital in...	Add flow switch
			Add digital in...	Add digital in #1
			Add 0/4-20	Add 0/4-20mA #1
			Chlori::lyser/0/1	Add parameters

		Ise::/Ph::lyser/0/2	Add parameters	Add pH	
				Add Temp.	
		Flow switch	Add parameters	Add flow	
			Configure	Type	State
				Invert pol	No
		0/4-20mA #1	Add parameters	Add mA in	
			Configure	Type	4-20mA
		digital in #1	Add parameters	Add DI 2	
			Configure	Type	Count
				Interval (s)	10
		Meas.settings	Interval (s)	5	
		Date time	Year:	YYYY (i.e. 2016)	
			Month:	MMM (i.e. Jan)	
			Day:	DD (i.e. 8)	
			Hour:	HH (i.e. 12)	
Minute:	mm (i.e. 43)				
Select language	English	Select with OK			
	Deutsch				
	Francais				
Parameter	FCI (Free chlorine)	Display settings	Name	FCI	
			Unit:	mg/l	
			Disp. Format:	2	
		Alarm settings	Require ack.	No	
			Al.lower	None (or desired value)	
			Al.Higher	0,9 (or desired value)	
		Output	4/20mA #2		
		Output settings...	(4mA):	0	
			(20mA):	2 (meas. range!)	
		pH compensation	Type	Auto	
			Source	pH	
		pH	Display settings	Name	pH
				Unit:	-
				Disp. Format:	2
			Alarm settings	Require ack.	No
	Al.lower			4 (or desired value)	
	Al.Higher			10 (or desired value)	
	Output	4/20mA #3			
	Output settings...	(4mA):	0		
		(20mA):	14		
	Temperature	Display settings	Name	Temp	
			Unit:	°C	
			Disp. Format:	1	
		Alarm settings	Require ack.	No	
			Al.lower	None (or desired value)	
			Al.Higher	45 (or desired value)	
	Output	None			
	Flow	Display settings	Name	Flow	
			Unit:	-	
			Disp. Format:	0	
		Alarm settings	Require ack.	No	
			Al.lower	0	
		Output	None		
DI 1	Display settings	Name	waterflo		
		Unit:	pulses		
		Disp. Format:	0		
	Alarm settings	Require ack.	No		
		Al.lower	0		
Output	None				
mA in	Display settings	Name	Setpoint		
		Unit:	mA		
		Disp. Format:	2		

		Alarm settings	Require ack.	No
			Al.lower	None
			Al.Higher	none
		Output		None
Controller	C1/FCl1	Setpoint	Type	external
			Source	0/4-20ma #1
			4 mA	0
			20mA	1 (or max. allowable value)
		Settings PID	Type	PID
			Kp (%)	40 (starting value)
			Ti (s)	200 (measure in system)
			Td (s)	0
			Stop on error	Yes
			Max. 100% (s)	180 (starting value)
			Disturb:	DI 1
			D. factor:	0,5
		Direction	up	
		Dead band	0,0	
		Source	FCl	
	Output	4/20mA #1		
	Alarm sources...	FCl	upper	
		Flow	lower	
		waterflo	lower	
	C2/PH	Setpoint	Type	Manual
			Setpoint	7 (or desired value)
		Settings PID	Type	PID
			Kp (%)	40 (starting value)
			Ti (s)	200 (measure in system)
			Td (s)	0
			Stop on error	Yes
			Max. 100% (s)	180 (starting value)
			Disturb:	none
			Direction	down
		Dead band	0,0	
Source		pH		
Output		Dig out #1		
Output settings...		Type	Pulse	
		Pulses (min:	180 (check pump settings!)	
Alarm sources...	pH	lower		
	Flow	lower		
	waterflo	lower		

3 PH measurement and dosing control of acid and base, bypass flow cell installation

3.1 Overview

- DID1-BF1-PH
- Control of dosing pumps for base (mA) and acid (mA)
- Output of measured values for pH on mA
- Alarm relay connected
- Additional external input: setpoint from upper controls (mA)

3.2 Installation options

	<p>Waterline:</p> <ul style="list-style-type: none"> 1 DID system 2 Dosing pump 3 Chemical tank (i.e. DTS) 4 Measuring water withdrawal 5 Outlet of measuring water to drain 6 Flow cell with sensors 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit <p>Water flow direction</p>
	<p>Circulatory system:</p> <ul style="list-style-type: none"> 1 DID system 2 Dosing pump 3 Chemical tank (i.e. DTS) 4 Measuring water withdrawal 5 Outlet of measuring water to drain 6 Flow cell with sensors 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 Breaker tank 14 Feedback line for measuring water, prohibited for drinking water in some countries, observe local regulations! 15 Circulation pump 16 Other system parts <p>→ Water flow direction</p>
	<p>Batch basin or tank:</p> <ul style="list-style-type: none"> 1 DID system 2 Dosing pump 3 Chemical tank (i.e. DTS) 4 Measuring water withdrawal 5 Outlet of measuring water to drain 6 Flow cell with sensors 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 Breaker tank 14 Feedback line for measuring water 15 Measuring water pump

3.3 Wiring:

Terminal no.	description	Cable gland	comment
1	Phase	M20	Power supply, observe local regulations For details see chapter 7.1
2	Neutral		
3	PE		
13	4-20mA-output #1 (+)	M16	Output of measured value pH to upper system control
14	4-20mA-output #1 (-)		
17	4-20mA-output #2 (+)	M12 #2	Base pump for details see chapter 7.3.1
18	4-20mA-output #2 (-)		
21	4-20mA-output #3 (+)	M12 #3	Acid pump for details see chapter 7.3.1
22	4-20mA-output #3 (-)		
24	4-20mA-input #1 (-)	M16	Input of setpoint for pH from upper system control
25	4-20mA-input #1 (+)		
31	Flow #1, Flow switch of flow cell, pre-wired in BF1/BF3	M12 #1	Not for DID with tank immersed sensors, pre-wired for DID with bypass flow cell
32	Flow #1, Flow switch of flow cell, pre-wired in BF1/BF3		
51	Alarm relay NO, Relay closes on alarm	M16	Alarm to upper system control, use terminal 52 and 51 OR 53
52	Alarm relay C, common connector		
53	Alarm relay NC, Relay opens on alarm		

3.4 Software settings

Screen	Subscreen1	Subscreen2	Setting	Value	
Status	Manage sensors	Add sensor	Add Modbus sensor	Ise::/Ph::lyser/0/2	
			Add digital in...	Add flow switch	
			Add 0/4-20	Add 0/4-20mA #1	
		Ise::/Ph::lyser/0/2	Add parameters	Add pH	Add pH
				Add Temp.	Add Temp.
		Flow switch	Add parameters	Add flow	Add flow
				Configure	Type
			Invert pol	No	No
		0/4-20mA #1	Add parameters	Add mA in	Add mA in
				Configure	Type
	Meas.settings	Interval (s)	5	5	
	Date time	Year:	YYYY (i.e. 2016)	YYYY (i.e. 2016)	
		Month:	MMM (i.e. Jan)	MMM (i.e. Jan)	
		Day:	DD (i.e. 8)	DD (i.e. 8)	
		Hour:	HH (i.e. 12)	HH (i.e. 12)	
		Minute:	mm (i.e. 43)	mm (i.e. 43)	
	Select language	English	Select with OK	Select with OK	
		Deutsch			
		Francais			
	Parameter	pH	Display settings	Name	pH
Unit:				-	
Disp. Format:				2	
Alarm settings			Require ack.	No	No
			Al.lower	4 (or desired value)	4 (or desired value)
			Al.Higher	10 (or desired value)	10 (or desired value)
Output			4/20mA #1	4/20mA #1	
Output settings...			(4mA):	0	0
			(20mA):	14	14
Temperature		Display settings	Name	Temp	
			Unit:	°C	
			Disp. Format:	1	
		Alarm settings	Require ack.	No	No
			Al.lower	None (or desired value)	None (or desired value)
			Al.Higher	45 (or desired value)	45 (or desired value)
Output		None	None		
Flow		Display settings	Name	Flow	

		Alarm settings	Unit:	-	
			Disp. Format:	0	
		Require ack.	No		
		Al.lower	0		
	Output			None	
	mA in	Display settings	Name	Setpoint	
			Unit:	mA	
			Disp. Format:	2	
		Alarm settings	Require ack.	No	
			Al.lower	None	
			Al.Higher	none	
	Output			None	
	Controller	C1/pH	Setpoint	Type	external
				Source	0/4-20mA in #1
4 mA				5 (or desired lowest pH)	
20mA				9 (or desired highest pH)	
Settings PID			Type	PID	
			Kp (%)	40 (starting value)	
			Ti (s)	200 (measure in system)	
			Td (s)	0	
			Stop on error	Yes	
			Max. 100% (s)	180 (starting value)	
			Disturb:	none	
			Direction	up	
Dead band			0,2		
Source					pH
Output					4/20mA #2
Alarm sources...			pH	higher	
		Flow	lower		
C2/PH		Setpoint	Type	external	
			Source	0/4-20mA in #1	
			4 mA	5 (or desired lowest pH)	
			20mA	9 (or desired highest pH)	
		Settings PID	Type	PID	
			Kp (%)	40 (starting value)	
			Ti (s)	200 (measure in system)	
			Td (s)	0	
			Stop on error	Yes	
			Max. 100% (s)	180 (starting value)	
			Disturb:	none	
			Direction	down	
		Dead band	0,2		
		Source			pH
		Output			4/20mA #3
	Alarm sources...	pH	lower		
Flow		lower			

4 PH measurement and dosing control of acid and base, with tank immersed sensor:

4.1 Overview

→ DID1-TI1-PH

→ Control of dosing pumps for base (mA) and acid (mA)

→ Output of measured values for pH on mA

→ Alarm relay connected

→ Additional external input: setpoint from upper controls (mA)

4.2 Installation options

	<p>Batch basin or tank:</p> <ul style="list-style-type: none"> 2 Dosing pump 3 Chemical tank (i.e. DTS) 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 tank 14 Immersed sensor 15 Signal line from sensor
	<p>Circulatory system:</p> <ul style="list-style-type: none"> 2 Dosing pump 3 Chemical tank (i.e. DTS) 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 tank 14 Immersed sensor 15 Signal line from sensor 16 Other system parts 17 Circulation pump → Flow direction
	<p>Waterline with breaker tank</p> <ul style="list-style-type: none"> 2 Dosing pump 3 Chemical tank (i.e. DTS) 9 Control unit CU382 10 Signal line to control dosing pump 11 Dosing line 12 Injection unit 13 tank 14 Immersed sensor 15 Signal line from sensor → Flow direction

4.3 Wiring:

Terminal no.	description	Cable gland	comment
1	Phase	M20	Power supply, observe local regulations For details see chapter 7.1
2	Neutral		
3	PE		
13	4-20mA-output #1 (+)	M16	Output of measured value pH to upper system control
14	4-20mA-output #1 (-)		
17	4-20mA-output #2 (+)	M12 #2	Base pump for details see chapter 7.3.1
18	4-20mA-output #2 (-)		
21	4-20mA-output #3 (+)	M12 #3	Acid pump for details see chapter 7.3.1
22	4-20mA-output #3 (-)		
24	4-20mA-input #1 (-)	M16	Input of setpoint for pH from upper system control
25	4-20mA-input #1 (+)		
51	Alarm relay NO, Relay closes on alarm	M16	Alarm to upper system control, use terminal 52 and 51 OR 53
52	Alarm relay C, common connector		
53	Alarm relay NC, Relay opens on alarm		

4.4 Software settings

Screen	Subscreen1	Subscreen2	Setting	Value	
Status	Manage sensors	Add sensor	Add Modbus sensor	Ise::/Ph::lyser/0/2	
			Add 0/4-20	Add 0/4-20mA #1	
		Ise::/Ph::lyser/0/2	Add parameters	Add pH	Add pH
				Add Temp.	Add Temp.
		0/4-20mA #1	Add parameters	Add mA in	Add mA in
				Configure	Type
	Meas.settings	Interval (s)		5	
	Date time	Year:		YYYY (i.e. 2016)	
		Month:		MMM (i.e. Jan)	
		Day:		DD (i.e. 8)	
		Hour:		HH (i.e. 12)	
		Minute:		mm (i.e. 43)	
	Select language	English		Select with OK	
		Deutsch			
		Francais			
Parameter	pH	Display settings	Name	pH	
			Unit:	-	
			Disp. Format:	2	
		Alarm settings	Require ack.	No	
			Al.lower	4 (or desired value)	
			Al.Higher	10 (or desired value)	
		Output		4/20mA #1	
		Output settings...	(4mA):	0	
			(20mA):	14	
	Temperature	Display settings	Name	Temp	
			Unit:	°C	
			Disp. Format:	1	
		Alarm settings	Require ack.	No	
			Al.lower	None (or desired value)	
			Al.Higher	45 (or desired value)	
		Output		None	
	mA in	Display settings	Name	Setpoint	
			Unit:	mA	
			Disp. Format:	2	
		Alarm settings	Require ack.	No	
			Al.lower	None	
Al.Higher			none		
Output			None		
Controller	C1/pH	Setpoint	Type	external	

			Source	0/4-20mA in #1
			4 mA	5 (or desired lowest pH)
			20mA	9 (or desired highest pH)
		Settings PID	Type	PID
			Kp (%)	40 (starting value)
			Ti (s)	200 (measure in system)
			Td (s)	0
			Stop on error	Yes
			Max. 100% (s)	180 (starting value)
			Disturb:	none
			Direction	up
			Dead band	0,2
		Source		pH
		Output		4/20mA #2
		Alarm sources...	pH	higher
	C2/PH	Setpoint	Type	external
			Source	0/4-20mA in #1
			4 mA	5 (or desired lowest pH)
			20mA	9 (or desired highest pH)
		Settings PID	Type	PID
			Kp (%)	40 (starting value)
			Ti (s)	200 (measure in system)
			Td (s)	0
			Stop on error	Yes
			Max. 100% (s)	180 (starting value)
			Disturb:	none
			Direction	down
			Dead band	0,2
		Source		pH
		Output		4/20mA #3
		Alarm sources...	pH	lower