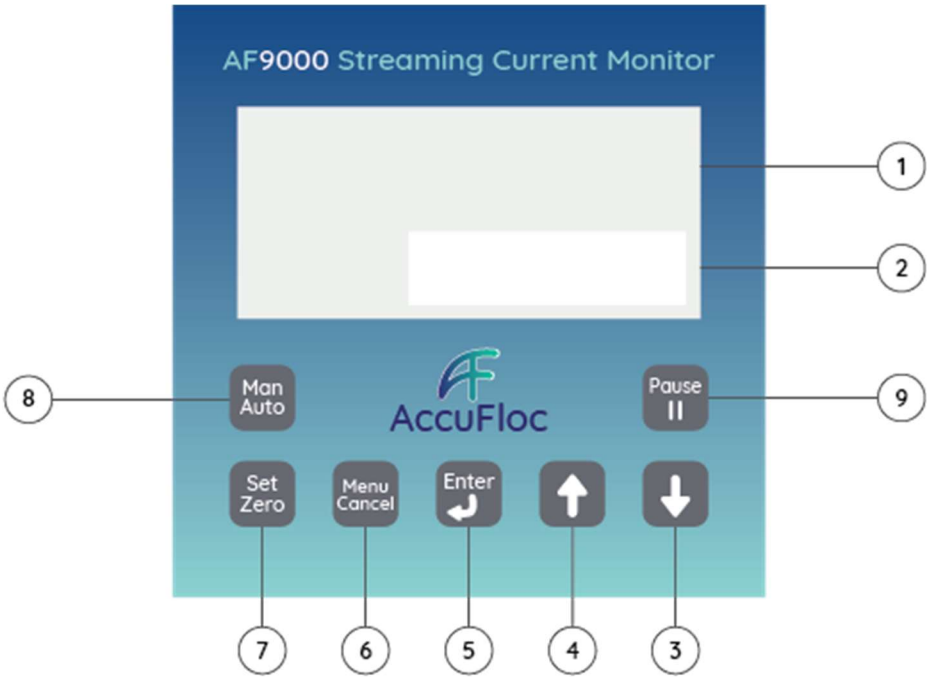
AF9000 Quick Reference Document

Display and keypad



Item	Name	Description
(1)	Top display	The deviation from the raw streaming current value shown on the bottom display or, if the zero point has been set, the deviation from the zero point. • 0 = Optimal amount of coagulant if the user has set the zero point based on the zeta potential or the jar test • – XX = The streaming current value is less than the optimum value. Coagulant may need to be added if the user has set the zero point based on the zeta potential or the jar test. • + XX = The streaming current value is more than the optimum value. The coagulant feed may need to be stopped if the user has set the zero point based on the zeta potential or the jar test.
(2)	Bottom display	Raw streaming current value ***Note:*** *"PXX"(e.g., P66) shows when the instrument has a PID controller that is set to manual mode. Push* ***Auto/Manual*** *to show the raw streaming current value.* *"PXX" identifies the percentage at which the PID controller is operating. For example, if the instrument output signal (4–20 mA) is 4 mA, "P00" shows. If the instrument output signal is 12 mA, "P50" shows. The percentage shown depends on the user settings.*
(3)	DOWN arrow key	Select a menu or option, set or change a value To adjust the zero point, push and hold an arrow key for 2 seconds, then push the applicable arrow key. • DOWN arrow = add more coagulant • UP arrow = add less coagulant ***Note:*** *When the optional 4–20 mA PID controller card is installed, the controller must be in manual mode to adjust the zero point. Push* ***Auto/Manual*** *to go to manual mode.*
(4)	UP arrow key	
(5)	Enter key	Select a menu item or accept an entry
(6)	Menu/Cancel key	Show the menu options or exit the menu options. Push the **DOWN** arrow to scroll through the menu options.

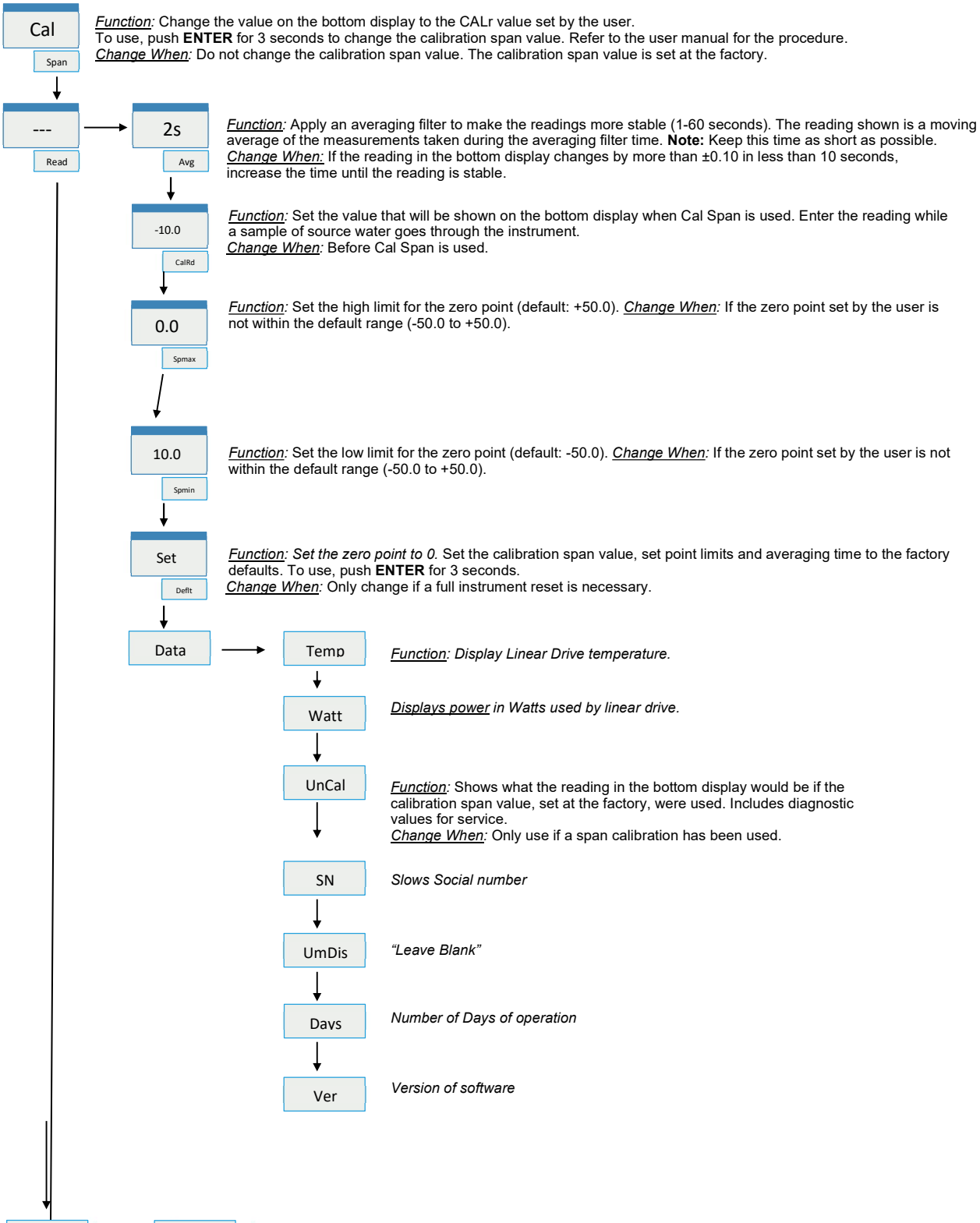
Item	Name	Description
(7)	Set Zero key	Set the zero point. The top display changes to "0". To set the zero point, push and hold **Set Zero** for 3 seconds. Set the zero point when the optimum coagulant dose is added and the reading is stable. ***Note:*** *Set the zero point again whenever there is a significant change in source water. Significant changes include seasonal changes such as lake turnover, after a storm or other high turbidity event and so on. It is important to keep the variation from the zero point very small so that the instrument can make fine adjustments.*
(8)	Auto/Manual key	When the 4–20 mA PID controller is used, push **Auto/Manual** to switch between automatic and manual controller mode. Model AF9000-2 only.
(9)	Pause	Push pause button to stop the linear drive. Push again to start.

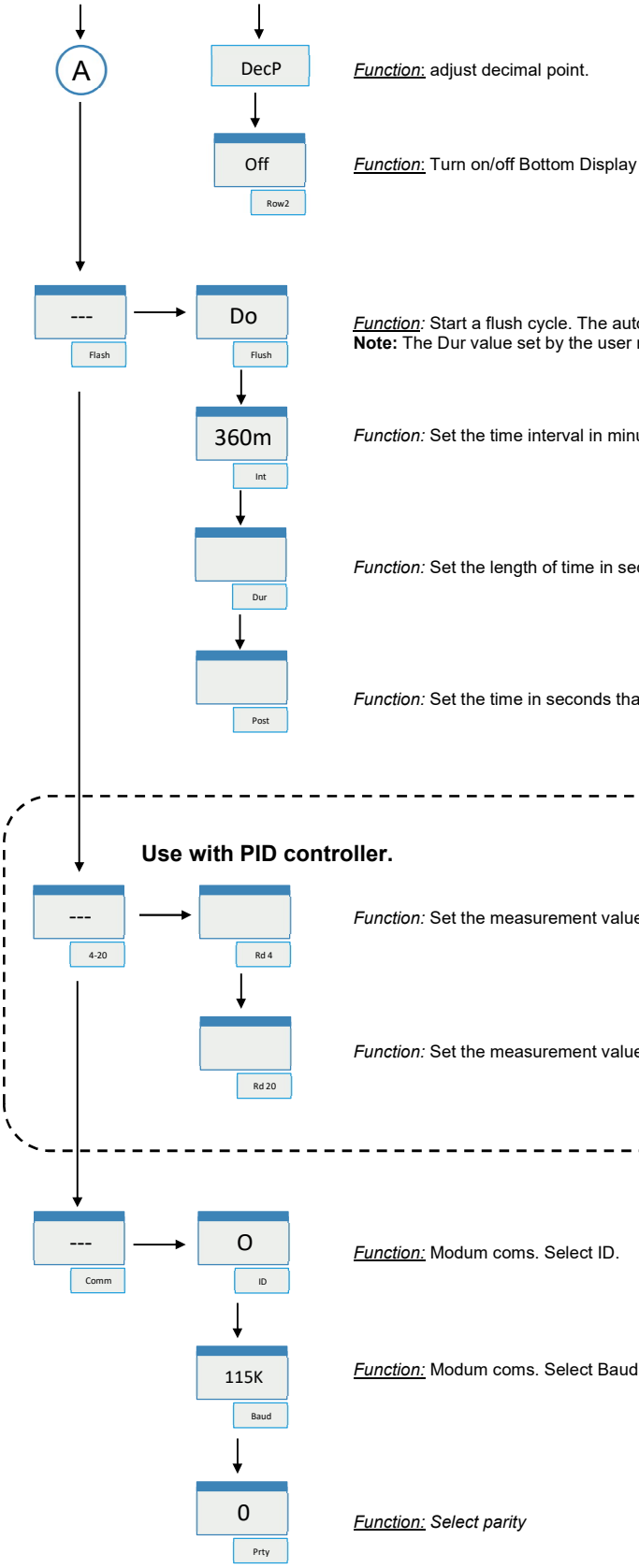
Configuration

Push **Menu/Cancel**, then push the **DOWN** arrow to scroll through the menu options. Push **Enter** to select a menu option. Refer to Figure 1.

To go back one menu level, push **Menu/Cancel**. To exit the menus, push **Menu/Cancel** until the reading shows.

Figure 1 Menu options





Function: adjust display brightness

Function: adjust decimal point.

Function: Turn on/off Bottom Display

Function: Start a flush cycle. The automatic flush timer is reset.
Note: The Dur value set by the user must be more than 0.

Function: Set the time interval in minutes between flush cycles (0= auto flush off).

Function: Set the length of time in seconds for the full flush cycle (0 = auto and manual flush off).

Function: Set the time in seconds that the measurement is held constant after a flush cycle.

Function: Set the measurement value that will result in a 4 mA output (default -10.0).

Function: Set the measurement value that will result in a 20 mA output (default+10.0).

Only shows in model AF9000-2

Function: Modum coms. Select ID.

Function: Modum coms. Select Baud rate.

Function: *Select parity*

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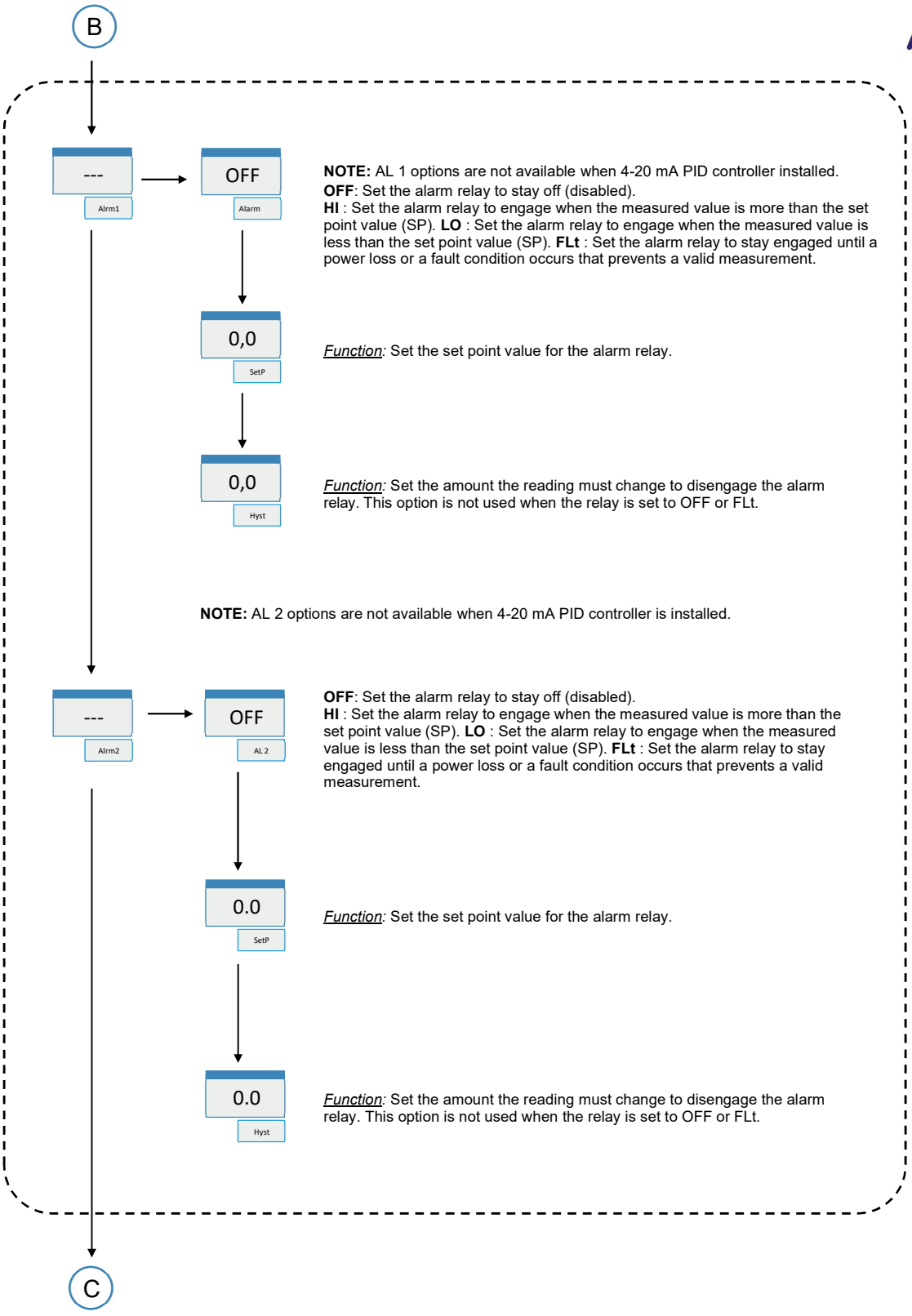

NOTE: AL 1 options are not available when 4-20 mA PID controller installed.
OFF: Set the alarm relay to stay off (disabled).
HI : Set the alarm relay to engage when the measured value is more than the set point value (SP). **LO** : Set the alarm relay to engage when the measured value is less than the set point value (SP). **FLt** : Set the alarm relay to stay engaged until a power loss or a fault condition occurs that prevents a valid measurement.

Function: Set the set point value for the alarm relay.

Function: Set the amount the reading must change to disengage the alarm relay. This option is not used when the relay is set to OFF or FLt.

NOTE: AL 2 options are not available when 4-20 mA PID controller is installed.

OFF: Set the alarm relay to stay off (disabled).
HI : Set the alarm relay to engage when the measured value is more than the set point value (SP). **LO** : Set the alarm relay to engage when the measured value is less than the set point value (SP). **FLt** : Set the alarm relay to stay engaged until a power loss or a fault condition occurs that prevents a valid measurement.

Function: Set the set point value for the alarm relay.

Function: Set the amount the reading must change to disengage the alarm relay. This option is not used when the relay is set to OFF or FLt.

Only shows model AF9000-2

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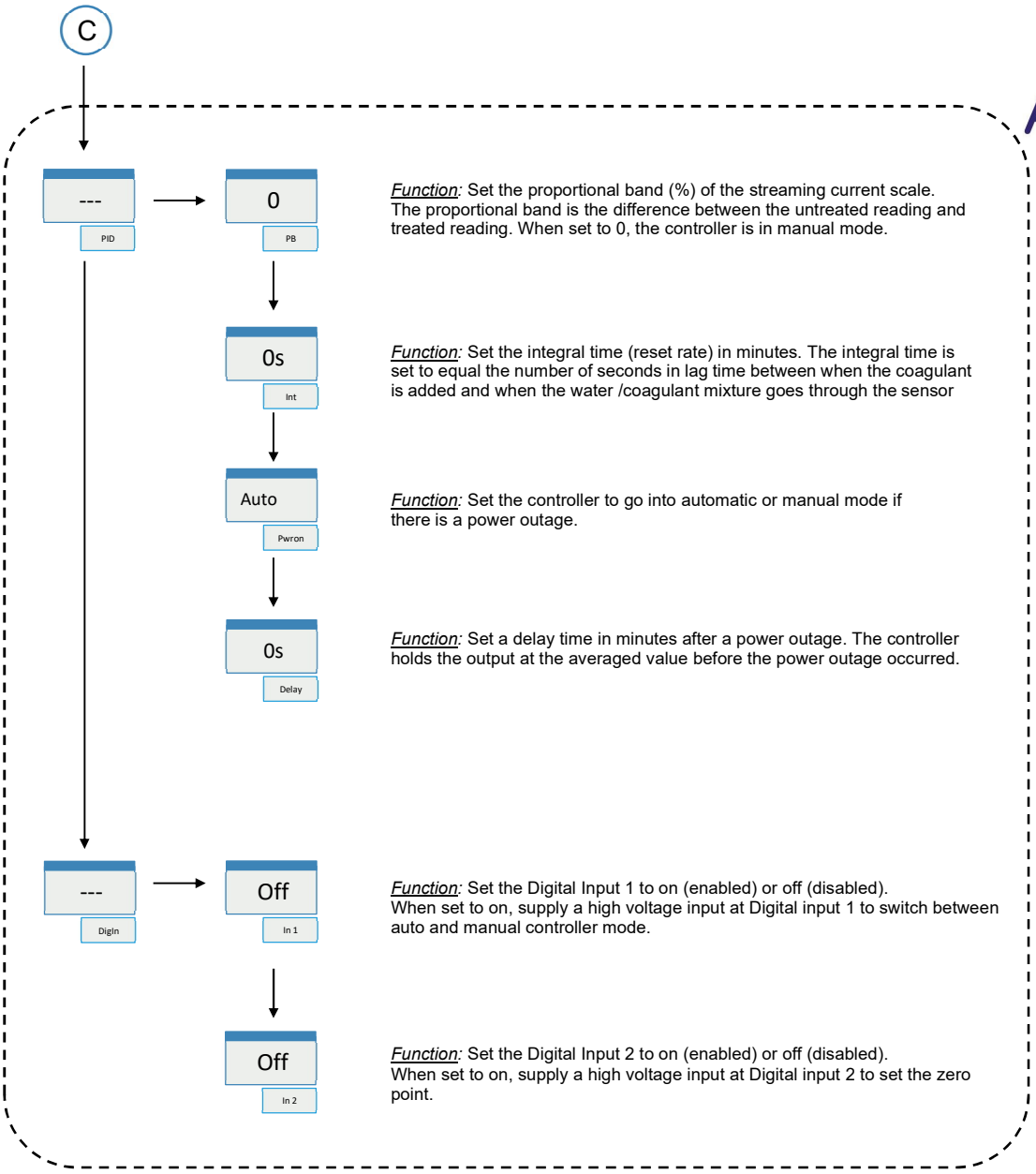

Function: Set the proportional band (%) of the streaming current scale. The proportional band is the difference between the untreated reading and treated reading. When set to 0, the controller is in manual mode.

Function: Set the integral time (reset rate) in minutes. The integral time is set to equal the number of seconds in lag time between when the coagulant is added and when the water /coagulant mixture goes through the sensor

Only show in AF9000-2

Function: Set the controller to go into automatic or manual mode if there is a power outage.

Function: Set a delay time in minutes after a power outage. The controller holds the output at the averaged value before the power outage occurred.

Function: Set the Digital Input 1 to on (enabled) or off (disabled). When set to on, supply a high voltage input at Digital input 1 to switch between auto and manual controller mode.

Only show in AF0

Function: Set the Digital Input 2 to on (enabled) or off (disabled). When set to on, supply a high voltage input at Digital input 2 to set the zero point.

Maintenance schedule

Table 1 shows the recommended schedule of maintenance tasks. Facility requirements and operating conditions may increase the frequency of some tasks.

Table 1 Maintenance schedule

Task	14 days	1 month	6 months	2 year	5 years
Examine and clean the sensor. [1]	X[2] (without auto-flush)	X[2] (with grit filter and auto-flush)			
Replace the piston.[3]				X	
Replace the linear bearings.[3]					X
Replace the sensor.[3]					X

[1] Refer to the instructions in the user manual.
[2] Do this task also after each high-turbidity event.
[3] Refer to the instructions that are supplied with the replacement part.

Troubleshooting

Problem	Possible cause	Solution
Reading continuously drifts	Gradual raw water change	Perform jar test to see if results changes. Check raw water pH for changes
	Dirt on piston and sensor	Follow cleaning procedure
	Sensor or piston worn	Inspect piston and sensor for scouring. Fit replacement piston or sensor.
Piston rattling and a little noisy	No sample flow Sample empty of liquid	Check sample is flowing through the measurement chamber and make sample is flowing out the discharge
Reading unstable and showing large variation.	Improper span calibration.	Return the calibration to the factory defaults or recalibrate the span to a large negative value
Reading is stable but un-responsive to coagulant dose changes.	Blocked sample line	Check sample flow rate. Clean grit trap.
	Dirt on piston and sensor	Follow cleaning procedure
	Coagulant saturation from overdosing	Ensure coagulant dosage is less than twice the optimal result from jar testing. This can also occur in low alkalinity waters.
Reading is reveresed. For example: decreases with increasing coagulant dose.	Reveresed span calibration	Ensure calibration value matches the calibration sample.
Reading has a continual cycle.	Process is cyclying	There is no mechanism by which a SCM can produce a constant cycle. Put all the control loops and flow control valves into manual to see if it stops.
Reading makes small rapid changes (Noise)	Poor mixing	Temporarily stop the sample flow, if reading becomes stable then ensure the sample is well mixed and or select a new better sample point to provide the well mixed sample.

		Ensure dosing pump is running properly and does not have an airlock.
	Electrical interference	If the problem presist when flow is removed then look for poor electrical grounding on the unit to nearby large motors or heaters.
Water leaking from drain hole	Water head level is above drain hole level	This is not a problem, but can be fixed by reducing inlet pressure, or outlet pressure as described in the installation section.
Blank display. Motor will not start.	No power	
Display shows Stop	Motor has stopped.	If unit is equipped with motor isolation switch-ensure it is on.
Display shows Hot	Acuator is too hot	Maybe caused by a very hot environment, check installation is not in full sun.
Display shows Connect	The actuator cable is not correctly plugged into the analyser	Check actuator cable connections and make sure are plugged in and tight.
Display shows Power	Power is not stable	Check electrical power connections
Display shows Stuck	Piston cannot move freely and needing too much force	Remove sensor and check piston is free to move and no grit is caught. Push up and down gently with fingers – should move freely
Display shows Coil	Internal coil is damaged	Actuator requires replacement
Display shows Fault then a number	Internal fault	Contact authorised service centre.

Replacement parts

Note: *Product and Article numbers may vary for some selling regions. Contact the appropriate distributor or refer to the company website for contact information.*

Description	Item no.
Grit filter, replacement	25091000
Linear bearings and washers, replacement kit	AF-958
Piston, replacement kit	AF-959
Streaming current sensor, replacement kit	AF-960
Tool kit, parts replacement	AF-767
Water connections kit. Includes weir, grit filter and automatic flush valve	AF-765
Water connections kit. Includes weir and grit filter (no automatic flush valve)	AF-766