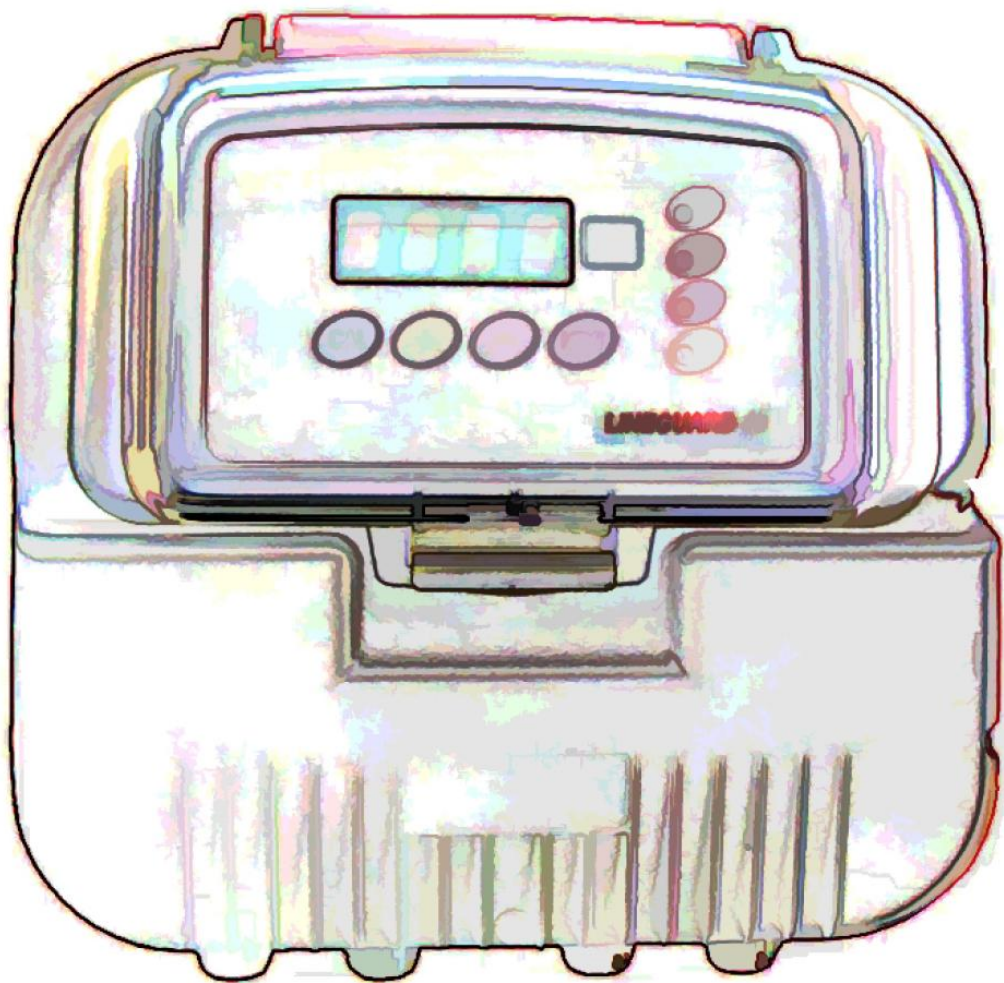


Installation & Programming Manual

LINEGUARD® SF 2000 pH
SERIES S507



This manual is addressed to personnel specifically responsible for the installation, control, and repair of Henkel systems. Any work performed by unauthorized personnel or actions that are in conflict with the information in this manual will automatically exclude all liability of the company for any possible consequences.

WARNINGS

The instrument you have purchased is designed and tested in compliance with IEC n° 348 and EN 61010-1 and is supplied in perfect condition. This instruction manual contains all the information and warnings that must be observed by the user to ensure safe operation of the instrument and to maintain it in good working order through the course of time. The instrument is designed for indoor use. However, it may be occasionally subjected to temperatures of between +5 and -10 °C without impairing its safety characteristics. In compliance with CEI EN 61010-1, the S507 instrument can be installed in areas with pollution level 2. The instrument and the present manual therefore comply with CEI 66/1, 2, 3, EN 61010-1 and harmonised standards EN 50081-1, EN 61000-3-2, EN 61000-3-3, and EN 50082-1. If the instrument is not installed and used as prescribed, the level of protection may be impaired. All handling, maintenance and repairs of systems must be carried out exclusively by suitably skilled personnel. All maintenance and repair work must be carried out with the system disconnected from the electrical supply and isolated from the liquid circuit.

The disposal of waste material and consumables must be carried out in compliance with statutory legislation.

VALIDITY OF THE WARRANTY

All our instruments are warranted for a period of 12 months since the date of their purchase. The warranty will be not recognized for the instruments for which the instruction of installation, maintenance and operation, which are included into this manual, are not followed.

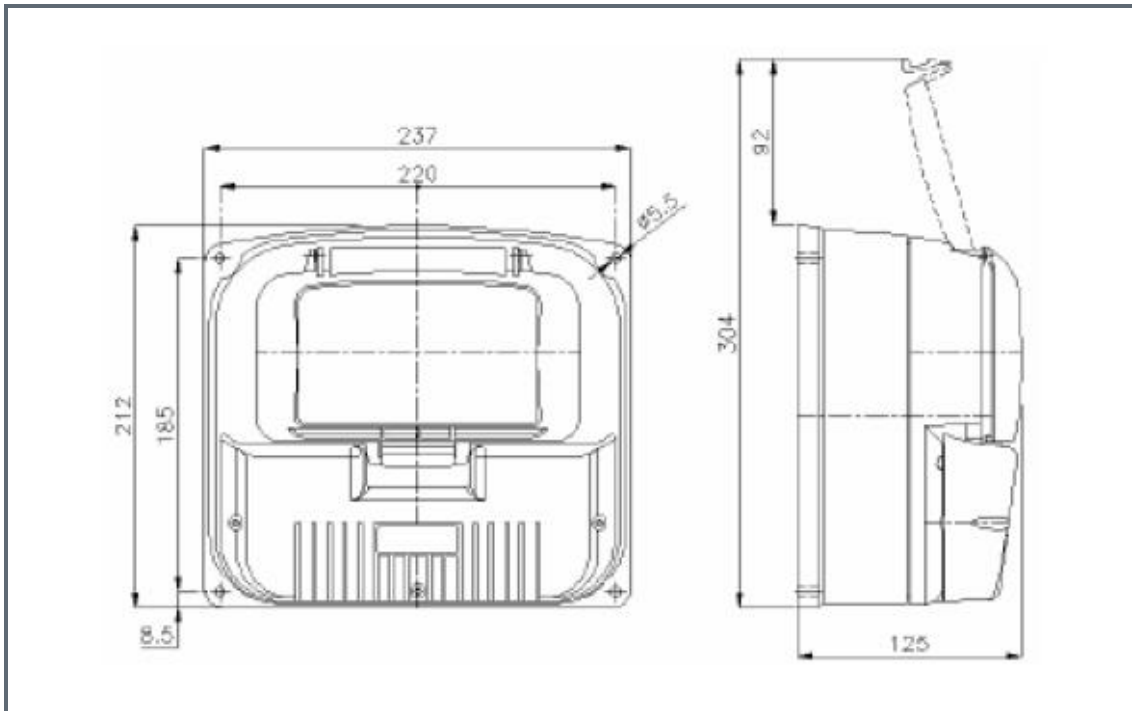
Contents

1. PACKAGE CONTENTS	4
2. DIMENSIONS	5
3. TECHNICAL SPECIFICATIONS	6
4. MAIN TECHNICAL NOTES	7
5. ELECTRICAL CONNECTIONS.....	8
6. OPERATING PRINCIPLE.....	11
7. POWER-ON	12
8. FRONT PANEL DESCRIPTION	13
9. PROGRAMMING WITH THE FRONT KEYPAD.....	14
10. LIST OF PARAMETERS	16
11. PARAMETERS EXPLANATION.....	17
12. AUXILIARY DISPLAYS	23
13. ERRORS.....	24
14. pH METER ELECTROCHEMICAL CALIBRATIONS.....	26
15. HYDRAULICS CONNECTIONS	28
16. ELECTRICALS CONNECTIONS	29

1. PACKAGE CONTENTS

1. The instrument, complete with pull-out terminal blocks on the rear
2. The present manual
3. The Cable 5 mt coaxial
4. The pH electrode
5. The SF 78 probe

2. DIMENSIONS



Made of ABS, overall dimensions 240 * 300 * h = 125 mm, suitable for wall mounting using 4 screws, mounting jig: h = 185mm, l = 220mm.

Protection rating: IP 66

Warning! The instrument is designed for panel mounting. It is prohibited to use the instrument if it is not correctly installed!

Weight: Approximately 1,5 Kg

Front panel: Polyester

3. TECHNICAL SPECIFICATIONS

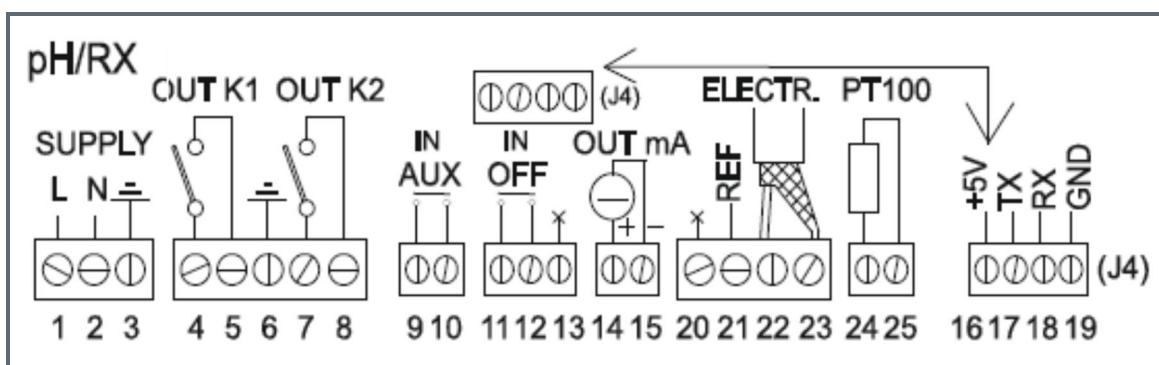
Power supply	230V~ +/- 10% 50-60Hz standard, 115V~, 24V~ +/- 10% 50-60Hz or 24V-+/- 10% on request (to be specified with order).
Power	7VA max (relay output version) 70VA max (version with K1 dosing-shot - pump magnet drive)
Protections	PTC Self-reset fuse, suitable for the supply voltage. Only with K1= dosing shot and power supply 230V~, fuse F2A size 5*20
Climatic conditions	Storage temperature -20...+60 °C Working temperature -10...+50 °C MAX humidity: 90% non-condensing
Display	LCD alphanumeric 16 characters * 2 lines
Analogue inputs	Precision better than 0.3% on F.S. Repeatability better than 0.2% on F.S.
Normalized input	On removable 4-pin terminal board (specify type of input, scale and transducer power supply, if any, in the order).
Conductivity	On pull-out terminal block. For cell with two electrodes + shield.
Relay outputs	N° 2 independent outputs. On pull-out 5-pin terminal block. Max. contact rating 250 V 3 A resistive.
Dosing-shot output	N° 1, available in place of K1 relay for direct drive of pump magnet. Standard pulse 300V and 90msec, max. frequency 120 pulses/min. Not available with 24V- or 24V~ power supply.
Current output	0/20 or 4/20 mA (selectable from program) into max 600 Ω load. Max Err. 0.5% on F.S. Galvanic isolation option can be supplied if specified with order.
Serial output	standard RS232 on removable 4-pin terminal board (or RS485, to be specified in the order).
Digital inputs	N° 1 OFF/LEV input to disable outputs (OFF in the case of standard K1 relay, level control (LEV) in the case of pump magnet drive relay K1). Accepts voltage-free contact. Voltage on terminals: 5V, max. current: 5mA. N° 1 temperature control (TC) input available only in the case of K1 prearranged for magnet drive, to be connected to motor protector coupled with magnet.

4. MAIN TECHNICAL NOTES

1. Facility to configure S507 output K1 as "magnet drive", i.e. suitable for direct control of the pump magnet. The use of a dosing pump without electronics is economically advantageous and results in increased reliability, provided instrument S507 (i.e. the electronic section) is installed well away from possible sources of liquids/fumes/humidity etc.
2. The absence of calibration trimmers on the front panel increases the protection rating.
3. Facility to inhibit outputs temporarily by means of ON-OFF button (e.g. for maintenance requirements).
4. Output relays are configurable as set-points or maximum / minimum alarms.
5. Current output freely programmable throughout entire scale, hence with facility for recording or proportional regulation.
6. Galvanic isolation option on current output to avoid interference due to connections with a PC or PLC with references connected to ground.
7. Serial line with PC to create memory of data/programming. Software available.
8. Display and automatic compensation for temperature changes by means of PT100, both in pH version and in conductivity meter version.
9. Easily reconfigurable by means of programming and conductivity meter scale change.
10. Alarms and errors (diagnostics) presented directly on display.
11. Program data / calibration data stored in non-volatile memory (minimum data retention of 10 years).

5. ELECTRICAL CONNECTIONS

For the wiring connections, refer to the screen print diagram present on the terminal board, specific for each type of instrument.



The difference between the various types of instruments implies variations only to the input terminal boards (pins 20...23); the rest remains unchanged. In case of doubt regarding the type of instrument, read the data on its plate. POWER SUPPLY: The "POWER SUPPLY" terminal board is the first to the left, characterized by terminals 1..3.

The power specified on the data plate is supplied to the instrument with a maximum deviation of $\pm 10\%$.

K1 OUTPUT (relay output version): Potential-free contact is available at terminals 4 and 5.

K1 OUTPUT (dosing pump K1 version): Lead the brown wire to terminal 4, the blue wire to terminal 5, the yellow/green wire coming from the dual pump cable to terminal 6 (Phase, Neutral, Earth).

K2 OUTPUT: Potential-free contact is available at terminals 7 and 8.

AUX INPUT: The auxiliary input is available at terminals 9 and 10, normally used for activating the auto-cleaning; other functions are available on request.

OFF/LEVEL INPUT: It is present at terminals 11, 12 and 13. On closure of the contact, after a suitable delay, the outputs are deactivated and the situation is shown on the display. In case of a simple contact, use terminals 11 and 12, in case of input from magnetic sensor (potentiostatic probe) connect the input to terminal 11 (black), negative to terminal 12 (blue), positive to terminal 13 (brown). Further details are given in the relevant paragraphs.

CURRENT OUTPUT: Available at terminals 14 (positive) and 15 (negative).

SERIAL OUTPUT: Available at terminals 16 (+5V), 17 (TX), 18 (RX), 19 (GND). This terminal board is slightly inconvenient since it is placed higher than the others.

MEASUREMENT INPUT: The measurement input is available at terminals 20 ... 23; for the connections, refer to the relevant paragraphs.

TEMPERATURE INPUT: A temperature probe PT100 can be connected to terminals 24 and 25. In case of long connections (approximately more than 5m) it is advisable to use a shielded cable with 2-pins+shield, with the shield connected to terminal 24.

NOTES:

1. Further information concerning the connection of inputs is given in the specific headings.
2. Before performing any operations ensure that the instrument is disconnected from the power supply!
3. Inverting the positions of the live and neutral power feeding wires means that the internal protections of the power supply will be connected to neutral rather than live: this situation will not impair the correct operation of the instrument.
4. The power circuit earth wire (terminal 3) must be connected to the electrical mains earth. The connection is not mandatory for safety purposes in the case of relay type K1 output, although it is useful because it allows the dispersal of any electrical interference carried on the power lines. In contrast, in the case of output K1 for dosing pump magnet drive, this connection is mandatory in order to earth the dosing pump magnet (by means of terminal 14).
5. With regard to connection of the input signals, note that the relative cables must be as short as possible and must be always kept separate from the power cables. The maximum length of the sensor cable depends on various factors. In any event never exceed 20 m in the case of pH or RX, 5 m in the case of low conductivity values, and 10 m in the case of medium-high conductivity values. Only in the case of amplified piezo resistive sensors or standardized inputs is it possible to arrive at lengths of up to 50...60 m, provided shielded cables are utilized. If greater distances are required consider the use of a galvanic isolator (e.g. SG91).
6. In the case of supplementary shields, these must be connected to the REF terminal. Never connect the earth contact to the REF terminal.
7. The max. load on the relay outputs is 3A and 250V~ (resistive load); with an inductive load the maximum current is 1A (with 230V~ power supply pumps or solenoid valves up to 200 VA can be driven directly).
8. The output relay contacts are not protected. It is mandatory to install a fuse or an alternative protection system that is commensurate with the applied load.
9. In the case of inductive loads the outputs must be protected with suitable arc and interference suppression systems (RC networks or varistors if AC, diodes or varistors if DC).
10. In the K1 pump magnet drive version, correct operation is guaranteed with the original pump cable (5 m). If this cable must be extended for contingent reasons associated with the specific plant, always use a cable of the same cross-section (and ideally of the same colour) and install it well clear of the signal cables (input).
11. To achieve correct operation of the instrument even in the presence of the worst possible interference conditions, adhere to the following prescriptions:
 - a. radio frequency suppressor ferrite P/N 5072.0020 installed on the power feeding cable, as shown below
 - b. shielding of the signal cable with a metal sheath connected to earth or to the REF terminal (use the most favourable solution)

- c. ferrite P/N 5062.0020 installed on the input signal cables, as shown below
- d. RC suppressors (or equivalent) in parallel with the load (the suppressors must be suitably sized)
- e. efficient earthing of the electrical cabinet in which the instrument is mounted
- f. shield with earthing of the current output cable if 20 m length is exceeded

Make one or more loops (if the cable section is such as to allow this) around the ferrite.

Note: the ferrites supplied with instrument are 2 (one for power supply, the other for the input). In case of a second input (temperature) with cable separated from the main input, to request a third ferrite.

6. OPERATING PRINCIPLE

The instrument is composed basically of the following modules:

1. Power supplier: connected to the power source, the power supplier provides the necessary power for operation of the other modules while minimising the presence of interference and fluctuations.
2. Microprocessor: this is the heart of the instrument; the microprocessor acquires the analogue parameters transmitted by the "input" module and converts them into the required scale. It then relays these values to the "display" module for viewing so that the main measurement can be correlated with the programmed values in order to decide the status of the "digital outputs" (K1 and K2) and the "analogue output" in mA. The microprocessor also reads the status of the keys for display/editing of data stored in the memory.
3. Input: depending on the type of instrument, this stage can be of different types; irrespective of the configuration it generates a signal that is compatible with the microprocessor input, adding an interference filter and relative protections.
4. Digital outputs: these are output relays complete with their control circuit; as an alternative K1 can be a solidstate switch for pump magnet drive.
5. Analogue output: makes it possible to "export" the value of the main measurement to peripheral devices. The instrument can be equipped with "galvanic isolation" in the case of connection to a PC/PLC which sometimes create short circuits to ground that have a negative effect on the acquired measurements.
6. Display: module designed to display all data, primarily the measurement data, and secondly the programming data.

7. POWER-ON



When the LG 2000 pH S507 is powered on it Performs a brief display test by activating all the segments and then presents a code relative to the instrument/software version; it then checks the status of memory data and presents any error codes or warning messages if the data are incorrect for any reason. For a detailed description of errors refer to the "ERRORS" heading.

After this phase the instrument assumes normal operating status and displays the incoming measurements, updating the current outputs and relays accordingly. If the + and – keys are pressed simultaneously at the time of power-on, instrument S507 performs a "test" program: the digit "0" is displayed and the ON LED flashes. This value, which simulates the measurement, can be increased or decreased using the + and – keys. Consequently the operation / programming of the current output and relays can be tested. To exit from this test, press NEXT.

8. FRONT PANEL DESCRIPTION

In addition to the display, the front panel has 5 keys and 3 LEDs:

1. [ON] key → Enables / disables the output relays (and pump magnet, if applicable)
2. [CAL] key → Allows the user to enter the "PROGRAMMING" and "CALIBRATION" routines
3. [+] key → Displays the "GAIN" value in normal display mode and increases the displayed variable when in setting and/or calibration mode.
4. [-] key → Displays the "OFFSET" value (deviation from zero) in normal mode or decreases the displayed variable when in setting and/or calibration mode.
5. [NEXT] key → Changes the display of the main measurement to temperature and vice versa; eliminates the modifications made to the displayed variable in setting and/or calibration mode. In the K1 magnet drive version this key provides access to manual mode.
6. LED [K1] → This LED shows the status of relay 1 (or the magnet): illuminated = relay ON = contact closed.
7. LED [K2] → Status of relay 2: illuminated = relay ON = contact closed.
8. LED [ON] → When steadily illuminated this LED indicates that the instrument is ON and no faults present. When flashing, indicates an operating fault (refer to the Errors heading) or outputs deactivated by means of the ON button.
9. Display → This is a normal display visualisation. Temperature is between brackets indicating the PT100 absence. In this case the working temperature programmed is displayed (P04). If PT100 is inside, the value indicated the real value and it appears without brackets.

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		(2	5		°	C)					

9. PROGRAMMING WITH THE FRONT KEYPAD

The following section describes the procedure for programming the 16 editable parameters from the front keypad.

C	A	L	I	B	R	A	Z	.		→		+	/	-	
	E	D	I	T	I	N	G			→		N	E	X	T

		E	D	I	T	I	N	G							
	P	R	O	G	R	A	M	M	A	Z	I	O	N	E	

#	T	I	P	O		M	I	S	U	R	A				
				0											

	T	I	P	O		M	I	S	U	R	A				
#				0											

1. Press the [CAL] key and keep it pressed for at least 2 seconds and it appears
2. Press the [NEXT] key
3. The message << Edi >> is displayed until the [NEXT] key is released
4. The display shows the message << P01 >> indicating the possibility to edit the first parameter
5. Press the [CAL] key
6. The value of parameter P01 will appear.
7. Press the [+] key to increase the value of P01
8. Press the [-] key to decrease the value of P01
9. Press the [CAL] key to confirm the new value
10. Press the [NEXT] key to retain the original value
11. The display shows the message << P02 >>, this being the ext parameter in the sequence

12. Proceed as per points 6...11
13. Continue as above until reaching the final parameter
14. To quit the programming function press the [NEXT] key

10. LIST OF PARAMETERS

Parameter No.	Description	Min. value	MAX value	Default value	Value set
P01	Type of measurement	0	2	0	
P02	Reserved	0.00	0.00	0.00	
P03	Reserved	0	1	0	
P04	Working temperature	0	100	25 °C	
P05	Automatic dosing-shot piloting frequency (only with K1 set-up)	1.0	120.0	120.0 imp/min	
P06	Manual dosing-shot piloting frequency (only with K1 set-up)	0.0	120.0	60.0 imp/min	
P07	Type of K1 operation	0	4	1	
P08	K1 Relay minimum threshold	-1000	2000	6.00 Ph	
P09	K1 Relay maximum threshold	-1000	2000	6.30 Ph	
P10	K1 Relay energization delay	0	120	0 sec	
P11	K1 Relay de-energization delay	0	120	0 sec	
P12	Type of K2 operation	0	6	1	
P13	K2 Relay minimum threshold	-1000	2000	6.50 pH	
P14	K2 Relay maximum threshold	-1000	2000	6.80 pH	
P15	K2 Relay energization delay	0	120	0 sec	
P16	K2 Relay de-energization delay	0	120	0 sec	
P17	Ignition delay	0	60	0 min	
P18	Type of mA output	0	1	1	
P19	mA output scale start	-1000	2000	0.00 pH	
P20	mA output full scale	-1000	2000	14.00 pH	
P21	mA value in case of error	0.0	21.0	21.0 mA	
P22	RS485 address	1	9	1	
P23	Password	0	999	0	
P24	Autoset	0	100	0	
(P25)	Measurement 1 scale start (mA vers. only)	-1000	2000	0	
(P26)	Measurement 1 full scale (mA vers. only)	-1000	2000	2000	
(P27)	p.v.+u.m. measurement 1 (mA vers. only)	0	255	0	

11. PARAMETERS EXPLANATION

PARAMETER 01 (standardized input version) MEASUREMENT TYPE

This version is prearranged and pre-calibrated for 0/20mA (P01=0) and 4/20mA (P01=1) analogue inputs.

IMPORTANT DON'T CHANGE P01=0

PARAMETER 02 RESERVED

This parameter is reserved for future implementations.

PARAMETER 03 RESERVED

This parameter is reserved for future implementations.

PARAMETER 04 WORKING TEMPERATURE

All S507 are calibrated for temperature measure, value used for the thermocompensation calculating. If the PT100 is not inside, the instrument can recognize the working temperature. When PT100 is missing, the indicated temperature is between brackets.

PARAMETER 05 AUTOMATIC INJECTIONS FREQUENCY

This parameter is utilised only if output K1 is preset for pump magnet drive. This parameter serves to define number of injections per minute that output K1 will reach in automatic ON-OFF operation (P06=1 or P06=2, see below) or the maximum number of injections per minute that the pump will reach in automatic proportional operation (P06=3 or P06=4). Normally the maximum value is 120 injections/minute.

PARAMETER 06 MANUAL INJECTIONS FREQUENCY

With output K1 preset for pump magnet drive, pump manual operation can be programmed. This parameter serves to set the required number of injections per minute.

PARAMETER 07 OUTPUT K1 OPERATING MODE

Six different operating modes of output K1 are defined, with the following codes:

0 = Operation disabled with K1 = relay, manual operation with K1 = pump magnet drive

1 = Contact closing when threshold is exceeded (K1=relay) or pump injections start when threshold is exceeded (K1=magnet drive); used to acidify (pH meter case), decrease redox potential, maintain low conductivity.

2 = Contact opening when threshold is exceeded (K1=relay) or pump injections stop when threshold is exceeded (K1=magnet drive); used to increase the pH value, chlorinate (redox meter or residual chlorine meter), supply additives that increase conductivity, etc.

3 = Upward proportional regulation (dosage increases as measurement increases), only if K1 is preset for magnet drive. With this regulation output K1 is Off with measurements below the minimum threshold (P07), then it starts to pulse slowly as the measurement increases until reaching the maximum frequency (set in P04) on reaching the maximum threshold set in P08. This technique serves to provide "soft" injection of reagent avoiding sudden high magnitude regulation changes due to switching between injection/stopped status.

4 = Downward proportional regulation (dosage decreases as measurement increases), only if K1 is preset for magnet drive. This is the opposite to regulation type 3, i.e. injection is zero with measurements above the threshold set in P08 and subsequently injection frequency increases as the measurement value falls, until reaching the maximum value (P04) in correspondence with the minimum threshold set in P07.

5 = Self-cleaning cycle with timed flushing: at fixed intervals, the Lineguard freezes the measurement, activates the relay K1 (which will be connected, for example a solenoid with the water) for a predetermined time, and then unlocks the measure maintaining K1 active, the end of the second interval freezes the measurement, de-energizes K1 and K2 energizes (which will be connected, for example a solenoid with water) for the time necessary to complete the washing, and then de-energizes K2, keeping frozen the measure will wait for the next cycle.

PARAMETER 08 RELAY 1 MINIMUM THRESHOLD

K1 intervention minimum threshold, in accordance with the above indications.

In the case of self-cleaning cycle with flushing, this parameter is the flushing time (in minutes)

PARAMETER 09 RELAY 1 MAXIMUM THRESHOLD

K1 intervention maximum threshold, in accordance with the above indications.

In the case of self-cleaning cycle with flushing, this parameter is the read time (in minutes)

PARAMETER 10 RELAY K1 ENERGISATION DELAY

A delay interval can be set for energisation of relay K1 if configured in operating modes 1 or 2. The value is entered in seconds. Enter zero to inhibit the delay interval (relay trips immediately).

In the case of self-cleaning cycle with flushing, this parameter is the time of washing (in minutes)

PARAMETER 11 RELAY K1 DE-ENERGISATION DELAY

As per parameter 9, but referred to de-energisation of relay K1.

In the case of self-cleaning cycle with flushing, this parameter is the dwell time between courses and later (in minutes)

PROPORTIONAL REGULATION NOTES (PWM)

To better understand the proportional regulation (PWM) see the below table:

	Up proportional regulation			Down proportional regulation		
Programming →	(P07) regulation type K1 = 3			(P07) regulation type K1 = 4		
	(P08) minimum threshold K1 = 500			(P08) minimum threshold K1 = 500		
	(P09) maximum threshold K1 = 700			(P09) maximum threshold K1 = 700		
	(P10) times base = 120 seconds			(P10) times base = 120 seconds		
	(P11) minimum times ON-OFF = 0 seconds			(P11) minimum times ON-OFF = 0 seconds		
Measure	TON	TOFF	Regulation	TON	TOFF	Regulation
≤ 500	0 sec	120 sec	0 %	120 sec	0 sec	100 %
520	12 sec	108 sec	10 %	108 sec	12 sec	90 %

540	24 sec	96 sec	20 %	96 sec	24 sec	80 %
550	30 sec	90 sec	25 %	90 sec	30 sec	75 %
600	60 sec	60 sec	50 %	60 sec	60 sec	50 %
650	90 sec	30 sec	75 %	30 sec	90 sec	25 %
≥700	120 sec	0 sec	100 %	0 sec	120 sec	0 %

For a correct function, choose the correct programming parameters:

The difference between minimum and maximum threshold must be higher than 20 points.

The minimum regulation time (P10 – P11) must be higher than 5 seconds

- a. The time base is chosen in function of regulator (Electrovalve 10÷20 seconds, electromagnetic dosing pump 120÷360 seconds, asynchronous motor > 600 seconds, etc...).
- b. Also in case of proportional regulation with output in mA (see P19 e P20) the difference between minimum and maximum threshold must be higher than 20 points.

PARAMETER 12 TYPE OF K2 OUTPUT OPERATION

The K2 output has seven (7) different operating modes, which are coded as follows:

0 = operation disenabled

1 = contact closure when threshold is exceeded

2 = contact opening when threshold is exceeded

3 = NC (normally closed) alarm, i.e. the K2 contact is closed when the value measured lies between the threshold settings (P12 and P13). It is useful for indicating that the value measured lies within an acceptable range. This type of signal may be used for signalling the correct working of the measurement chain; if the instrument enters alarm status for any reason whatsoever (or is switched off), this signal disappears.

4 = NO (normally open) alarm, i.e. the K2 contact is open when the measured value lies between the threshold settings (P12 and P13). Normally used for activating an alarm signal in case the measured value is too low (less than P12) or too high (more than P13).

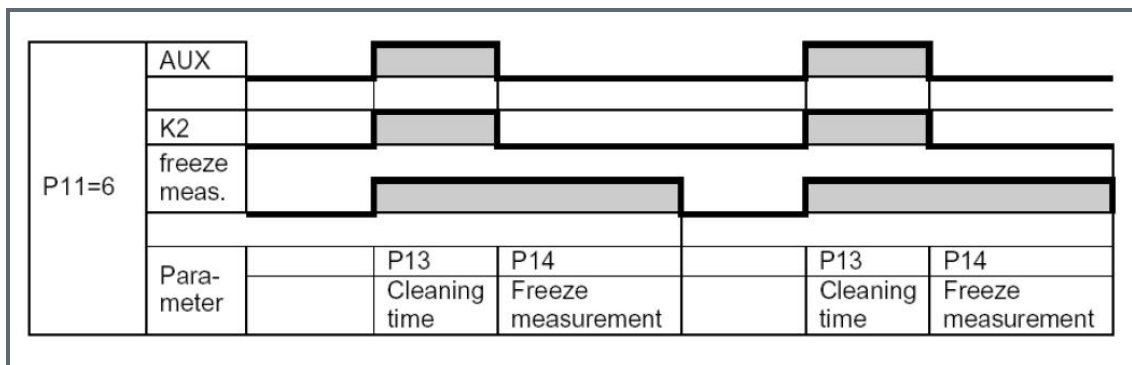
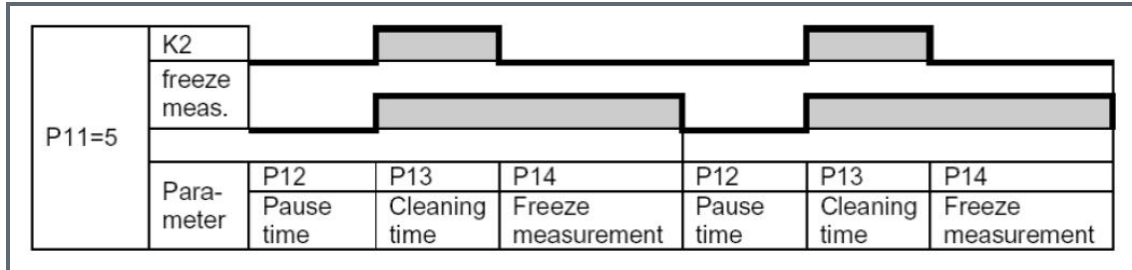
5 = cyclic auto-cleaning: the instrument freezes the measurement at prefixed intervals, activates the K2 relay (to which solenoid valve or similar device will be connected with the detergent) for a predefined time, then deactivates K2 (therefore the action of the detergent must finish and the measurement liquid must return), keep the measurement frozen for some more time, then resume normal working. The cleaning times are set in the successive parameters. During the auto-cleaning, "AUC" flashes on the display.

6 = auto-cleaning synchronized with the aux contact: it is the same cycle as mode 5, but auto-cleaning starts only when the input concerned is active.

When the contact closes the current output AUX IN will be the value set in parameter P21. The timing of the cycle timer are set by the operator (see parameters later).

NB: During the cycle, the measurement can be frozen, and it is impossible to calibrate electrochemistry. To do this, simply hold the NEXT button for 2 seconds: time remaining at the end of the stage will be locked in place, the measurement can be thawed, any energized relays will be turned off and the LED ON / OFF will flash as follows: 5 switching speed and a pause of 1 second. To reactivate the cycle, press the NEXT button for 2 seconds.

The following graphs show the working of the two "auto-cleaning" modes.



PARAMETER 13 RELAY 2 MIN. THRESHOLD

It is the minimum action threshold of K2, according to the indications given above.

In case of cyclic auto-cleaning (P11=5) it is the pause time between two auto-cleaning cycles, in minutes.

PARAMETER 14 RELAY 2 MAX. THRESHOLD

It is the maximum action threshold of K2, according to the indications given above.

In case of cyclic auto-cleaning (P11=5) it is the washing time, in minutes.

PARAMETER 15 K2 RELAY ENERGIZATION DELAY

K2 relay energization delay, can be entered in seconds.

In case of cyclic auto-cleaning (P11=5 or 6) it is the measurement freezing delay at the end of the wash cycle, in minutes.

PARAMETER 16 K2 RELAY DE-ENERGIZATION DELAY

K2 relay de-energization delay, can be entered in seconds.

PARAMETER 17 IGNITION DELAY

At switch-On, it may so happen that the sensor connected to the input does not give correct values, while awaiting stabilization. A classic case - the redox electrode immersed in oxygenated water, reaches the correct value after many minutes. During the measurement stabilization phase, the instrument however activates the outputs according to the value measured at the input. In certain cases, this may be a problem. By entering a suitable delay on

this parameter (in minutes), the instrument is kept in stand-by. Entering zero means this delay is not activated.

PARAMETER 18 OUTPUT TYPE IN CURRENT

This parameter accepts only value 0 or 1. The zero selects output type 0/20 mA, while one selects output 4/20 mA.

N.B.: The precision at the current output refers to output values greater than approx. 0.3mA. Consider therefore that the current output start scale in case of 0/20mA, is not accurate.

PARAMETER 19 OUTPUT SCALE START IN CURRENT

The measured value corresponding to the current output start (0 or 4 mA depending on P16) is set. For example, in case of a pHmeter, to obtain 4 mA at 3.50 pH, here, in P17, the value must be set as 3.50 (obviously P16 will be 1).

PARAMETER 20 CURRENT OUTPUT FULL SCALE

The measured value corresponding to the current output full scale (20 mA) is set. For example, in case of a pHmeter, to obtain 20 mA at 8.40 pH, this value must be entered in P18.

PARAMETER 21 CURRENT OUTPUT VALUE IN CASE OF ERROR

Set the current value which the output must assume in case of error (e.g. value measured in over-range or measurement disabled because input is OFF, etc...).

PARAMETER 22 RS485 ADDRESS

Data to be used only if the instrument is set up for RS485 and is inserted in a small network consisting of a PC with suitable management SW and a number of S507 instruments. Each instrument in this network must have its own address so that it can be recognized correctly, and it is this parameter.

PARAMETER 23 PASSWORD

It is possible to block the instrument use putting a password (a value different from 0). Attention! If you missing the password is not possible to enter in the programming, send the instrument to the constructor!

PARAMETER 24 AUTOSET

By means of this parameter it is possible to set the S507 with the factory values (P01..P23). This operation may be useful in case absurd data have been set. The value to be entered for activating the autosest function (unless otherwise indicated) is 12. After setting this value, <<ESE>> appears on the display for about 3 seconds.

	A	U	T	O	S	E	T								
	E	S	E	G	U	I	T	O		i					

(PARAMETER 25) MEASUREMENT 1 SCALE START

Present only in the mA input version, it is the value shown on the display corresponding to scale start (0 or 4mA). It is set at the factory according to the order specifications. Do not modify this value.

(PARAMETER 26) MEASUREMENT 1 FULL SCALE

Present only in the mA input version, it is the value shown on the display corresponding to full scale (20mA). It is set at the factory according to the order specifications. Do not modify this value.

(PARAMETER 27) 1 DECIMAL POINT POSITION AND UNIT OF MEASUREMENT

Present only in the mA input version, serves to set the position of the decimal point and the unit of measurement on the display, It is set at the factory according to the order specifications. Do not modify this value.

12. AUXILIARY DISPLAYS

Press the [-] and [+] keys in normal operating mode (i.e. not in the above described calibration procedures) to produce the following displays:

key [+] gain multiplication factor (0.750 ... 1.500)

key [-] offset in points (-100 ... 100)

N.B. : At the time of initial calibration the values are set as follows: OFFSET = 0, GAIN = 1.000.

When the keys are pressed together the display shows the value of injections/minute (only in the case of S507 with K1 output in dosing pump version).

13. ERRORS

All errors or faults detected by the microcontroller are shown on the display, accompanied by flashing of the ON LED, also in accordance with the following codes:

A.01 : Warning 01

No operating mode has been set for output K1. The instrument will anyway continue to function correctly.

A.02 : Warning 02

No operating mode has been set for output K2. The instrument will anyway continue to function correctly.

E.01 : Error 01

Proportional regulation has been set for output K1 with minimum and maximum thresholds that are too close together (P08 and P09). In these conditions regulation with K1 will not work properly. Re-program P08 and P09.

E.02 : Error 02

An excursion on the mA output has been set with minimum and maximum thresholds that are too close together (P19 and P20). In these conditions the mA output will not work properly. Re-program P19 and P20.

E.03 : conductivity range choice

An impossible range has been requested. Re-programming P01.

Calibration error

An impossible calibration has been requested (e.g. pH offset with the electrode immersed in a solution at 4pH). Repeat the operation checking electrode, cables, buffer solution, etc..

OFF CONTACT LEVEL OR FLOW

The input contact to terminals 11 and 12 is closed, blocking the instrument (in this case t the outputs are inhibited). To verify the sensor:

- S507 with K1 relay output version dosing-shot: level control indicates the water missing to inject. Replenish the level.
- S507 with relay output K1: it is an external request indicating an external request to deactivate the outputs.

HOLD MEASURE CONTACT:

The input contact to terminals 9 and 10 is closed and the measure are blocked.

HEA : Temperature dosing-shot

Only with S507 with output K1 in dosing shot version: The temperature control connected to its input indicates over-temperature on the pump magnet. Wait for the temperature to return to within the acceptable range. In this condition the outputs are inhibited.

UR/OR : Under range/Over Range

The input signal is above the maximum value established for the instrument in question. Check the sensor connected to the input and relative cables. In this condition the outputs are inhibited.

Note: All errors signalled by flashing of the ON LED result also in positioning of the mA output to the value set in parameter P20.

14. pH METER ELECTROCHEMICAL CALIBRATIONS

Before starting this procedure, make sure that freshly produced buffer solutions are available (ensure the solutions have not degenerated).

When using temperature compensation, the PT100 must be immersed in the buffer solution to read the temperature.

1. Wash the electrode with distilled water
2. Immerse the electrode in the 7.01 pH buffer solution
3. Press the [CAL] key and hold it down for at least 2 seconds
→ the display will present the message << CAL >>

C	A	L	I	B	R	A	Z	.		→		+	/	-	
	E	D	I	T	I	N	G			→		N	E	X	T

		O	F	F	S	E	T								
		7	.	0	1		p	H							

4. Press the [-] key the Lineguard 2000 pH S507 display
5. Release the [-] key the display will present the buffer solution value (acquired automatically) at 7.01 pH
6. Press the [+] key to increase the calibration value if necessary
7. Press the [-] key to decrease the calibration value if necessary
8.
 - a. Press the [CAL] key to confirm the new calibration value
 - b. Press [NEXT] to retain the previous calibration in the memory (the new calibration setting is lost)
9. Wash the electrode with distilled water
10. Immerse the electrode in the 4.01 pH (or 9.01 pH) buffer solution
11. Press [CAL] and hold it down for at least 2 seconds the display will present the message << CAL >>

C	A	L	I	B	R	A	Z	.		→		+	/	-	
	E	D	I	T	I	N	G			→		N	E	X	T

			G	A	I	N									
		4	.	0	1		p	H							

12. Press [+] → the Lineguard 2000 pH S507 display will present the message <<GAI>> (i.e. gain calibration)
13. Release the [+] key → the display will present the buffer solution value (acquired automatically) at 4.01 pH (or 9.01 pH)
14. Press [+] to increase the calibration value if necessary
15. Press [-] to decrease the calibration value if necessary
16.
 - a. Press [CAL] to confirm the new calibration value
 - b. Press [NEXT] to retain the previous calibration value in the memory

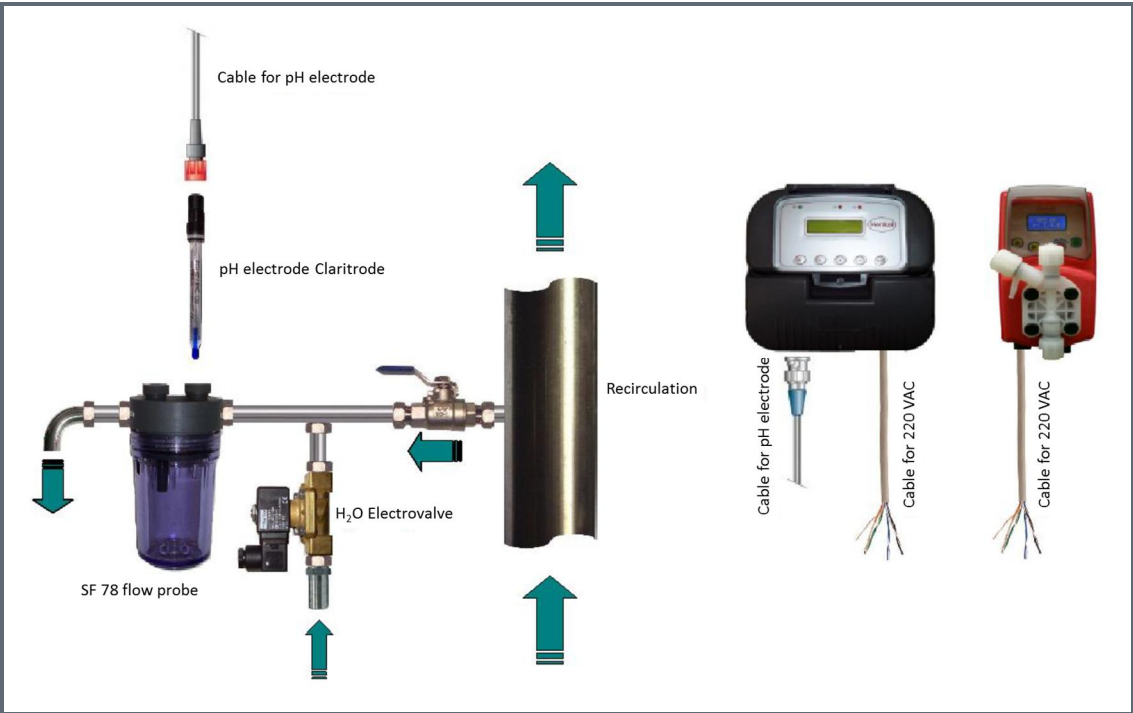
If the instrument fails to read the buffer solutions automatically there are three possible causes:

- a) The buffer solution has been modified
- b) The electrode is malfunctioning or the electrode material is depleted
- c) The electrode cable is not connected correctly

Page 17 of 29

If you attempt to set the offset to values that differ significantly from 7.00 pH, the S507 instrument will automatically generate the message << ERR >> and reject the calibration. Also if you attempt to set the gain with buffer solutions whose pH is too close to the neutral value, instrument Lineguard 2000 pH S507 will reject the calibration.

15. HYDRAULICS CONNECTIONS



16. ELECTRICAL CONNECTIONS

