TECHNICAL MANUAL

CONTROL R204.1

TRANSLATION OF ORIGINAL TECHNICAL MANUAL EN

NOTE

Keep the operating manual for future use!

ATTENTION

Subject to technical modifications!

Quality notes

The **sera** quality management and quality assurance system is certified in accordance with DIN EN ISO 9001:2015.
The **sera** product complies with the applicable safety requirements and accident prevention regulations.

About this instructions

Special notes in these instructions are marked with text and danger symbols.

NOTE

Notes or instructions that faciliate work and ensure a safe operation.

ATTENTION

The non-observance of these safety instructions can result in malfunctions or material damages.

WARNING

The non-observance of these safety instructions can lead to material damages and personal injuries.

Note on the additional instructions „SAFETY INSTRUCTIONS SI01“.

These technical manual is divided into the following main parts:

WARNING

Observe and follow the safety instructions by all means.
See the additional instructions „SAFETY INSTRUCTIONS".
Man, machine and environment are endangered if the safety instructions are not observed.

General

sera products are checked for perfect condition and function previous to shipment.
Check for transport damage immediately after arrival of goods. If damage is found, this is to be reported immediately to the responsible carrier and the manufacturer.

Storage

An undamaged packaging protects the unit during storage and should only be opened when the product is installed.
Proper storage increases the service life of the product and includes prevention of negative influences such as heat, moisture, dust, chemicals etc.

The following storage specifications are to be obsered:

- Storage place: cool, dry, dustfree and slightly ventilated
- Storage temperature and relative air humidity see Chapter „TECHNICAL DATA".
- The maximum storage time for the standard packaging is 12 months.

If these values are exceeded, metal products should be sealed in foil and protected from condensation water with a suitable desiccant.

Do not store solvents, fuels, lubricants, chemicals, acids, disinfectants and similar in the storage room.

AMBIENT CONDITIONS	
Max. relative humidity	< 90%

TEMPERATURE DATA	
Max. operating temperature	40 °C
Min. operating temperature	0 °C
Max. storage temperature	40 °C
Min. storage temperature	0 °C

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SI01

ATTENTION

The pump restarts in the selected operating mode after the power supply was switched on or a power supply recovery following a mains failure!

ATTENTION

Switching the voltage supply on and off temporarily is to be avoided!
A waiting time of at least two minutes must be observed between switching the pump off and on again!

ATTENTION

Only operate the pump when it is connected to an earthed power supply!

Electric supply

The sera – magnetic diaphragm pump is delivered ready for installation. Standard delivery includes a 2m power cable with Euro plug. The standard version R 204.1 of the dosing pump is designed for an operating voltage range of 100 – 240V, 50/60Hz.

Symbol:

Connecting the control cables

The connections for the control cables are on the back of the pump, below the control panel.

Symbol:

Connector socket for analog, pulse and external stop inputs

NOTE

The control cables are not included in the standard delivery (optionally available). The leads of the connecting cables are colour coded.

The table shows the identification of the leads of the optionally available 5-pin control cable.

Lead colour	Pin	Function
brown	1	Analog input (+)
white	2	Pulse input
blue	3	External stop input
black	4	Signal + / 5 V DC
grey or green-yellow	5	Earth

There are 4 possibilities for the external control (Auto operation) of the dosing pump:

- Pulse mode
- Pulse mode with external stop
- Analog mode 4-20mA
- Analog mode 4-20mA with external stop

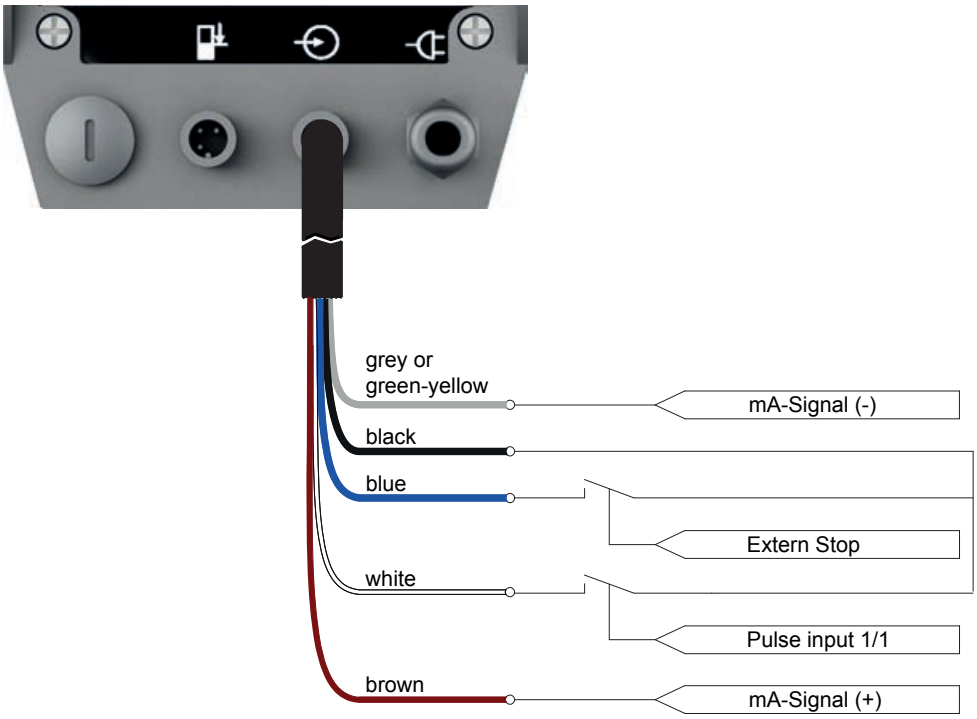
NOTE

The analog input has priority when pulse and analog input are activated simultaneously; this means that the applied pulse signal will not be evaluated.
If the analog signal is < 4mA, then the pulses received at the pulse input will be evaluated and applied.

The digital inputs (pulse and external stop) can not only be switched by a potential-free contact signal but also directly via a control voltage signal (e.g. 24V DC).

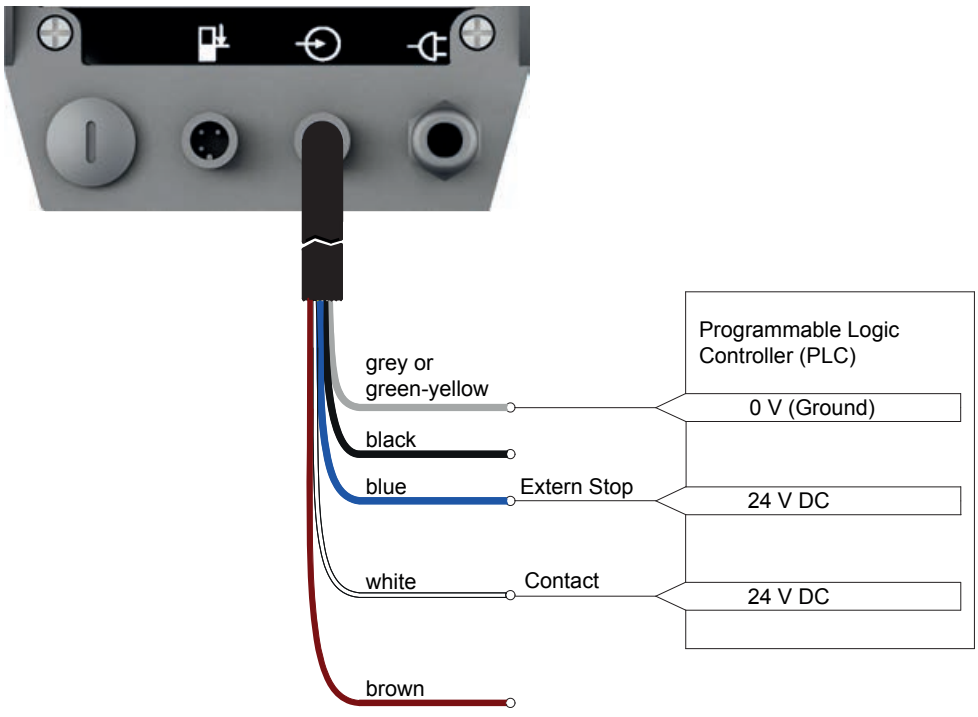
This enables, for example, the direct connection of a programmable logic controller to the dosing pump.

Pin assignment of control inputs:



The figure shows exemplarily the direct activation of the digital inputs (pulse and external stop) via a control voltage signal (in this case: 24V DC) of a programmable logic controller.

Direct activation of the digital inputs via control voltage signal of a programmable logic controller:



ATTENTION

The maximum voltage withstand capability of the inputs is 30V DC.

ATTENTION

The maximum current withstand capability of the inputs is 50mA.

ATTENTION

The signal + connection pin (lead colour: black) is not short-circuit proof! In case of a short-circuit, the control electronics may get damaged!
Therefore, please make absolutely sure that the signal + connection pin is not connected with the earth connection (lead colour: grey)!

Pulse input

The pump can be activated via a pulse signal. Each input signal will trigger the magnetic diaphragm pump to perform a stroke.

NOTE

Each input signal will trigger the magnetic diaphragm pump to perform a stroke.
The pulse transmitter (e.g. the contact water meter) must be set accordingly.

ATTENTION

The minimum pulse length is 50ms. If smaller pulse lengths are present, then the pulses might not be recognised by the control electronics.

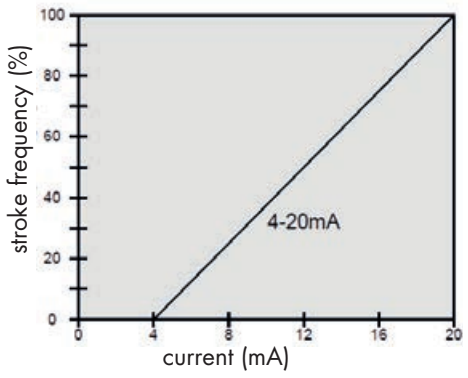
ATTENTION

The frequency of the incoming pulses must not exceed the maximum stroke frequency of the pump (= 150 l/min).

Analog input

The pump can be activated via an analog signal (4-20mA).
A signal with a control current of 4mA corresponds to 0% stroke frequency, a signal with 20mA corresponds to 100% stroke frequency. In this range, the stroke frequency behaves proportionally to the control current.

Stroke frequency in dependency of a control current of 4-20mA:



External stop input

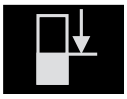
Using the external stop input, the dosing pump can be stopped via an external signal, no matter which operating mode the pump is in.
While the signal is present, the pump will be stopped. When the external stop signal is removed, the pump will run with the preset stroke frequency (depending on the operating mode).

Level input with pre-alarm and dry run

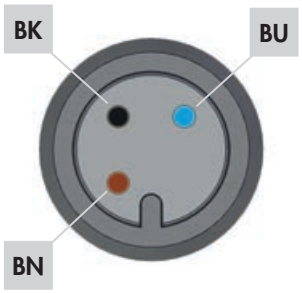
NOTE

Pre-alarm and dry run are connected to the same jack. When leaving the factory, both inputs are preset to "closing when floating down". However, if necessary, they can be freely configured (see Chapter „Configuring the level input").

Symbol:



Jack for level input



Wire colour		Pin	Function (factory setting)
BN	(brown)	Pin 1	Pre-alarm level
BU	(blue)	Pin 3	Ground
BK	(black)	Pin 4	Dry-Running

The inputs can be switched using a floating contact signal.
Pre-alarm and dry running are set to normally open floating contacts at the factory.
The sockets of the connections are A-coded and the assignations of the functions are symbolically labelled.

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SI01

Operating elements

1	STOP/START button
2	LED operation signals
3	stroke length adjustment
4	AUTO/MANU button

LED operation indicators

Three light-emitting diodes (LED) indicate the status of the pump:

Green: Operation and stroke indicator

In Auto mode, the green LED indicates the operational readiness of the pump. It works in combination with a stroke indicator; during pump operation, the LED flashes in accordance with the current stroke frequency.

Yellow: Operation and pre-alarm indicator

In manual operation, the yellow LED lights steadily.
If the level monitoring is connected, the pre-alarm is indicated by a flashing yellow LED.

Stop and dry run indicator

If the pump was stopped (manually or via external stop), then the red LED lights steadily. If the level monitoring is connected, the dry run is indicated by a flashing red LED.

Overview of LED indicators	Green LED	Yellow LED	Red LED
Manual operation		On	
Level pre-alarm		Flashes	
Dry run			Flashes
External stop			On
Manual stop			On
Ready (Auto mode)	On		
Stroke confirmation	Flashes		
No mains			

NOTE

The "dry run" error message suppresses the "pre-alarm" message. This means that if the pump runs dry while the 2-stage level monitoring is activated, then only the red LED will flash.

Key operation

Operation of the pump is performed with 2 buttons:

STOP/START button	
STOP / START	After connection to the power supply, the pump is switched ON/OFF using the STOP/START button.
AUTO/MANU button	
AUTO / MANU	The AUTO/MANU key is used for selecting between Manual and Auto operation (external control).

Stroke length adjustment

Using the knob for stroke length adjustment, you can mechanically adjust the effective stroke to a value between 0…100%.

ATTENTION

Stroke length adjustment may only be performed while the pump is running.

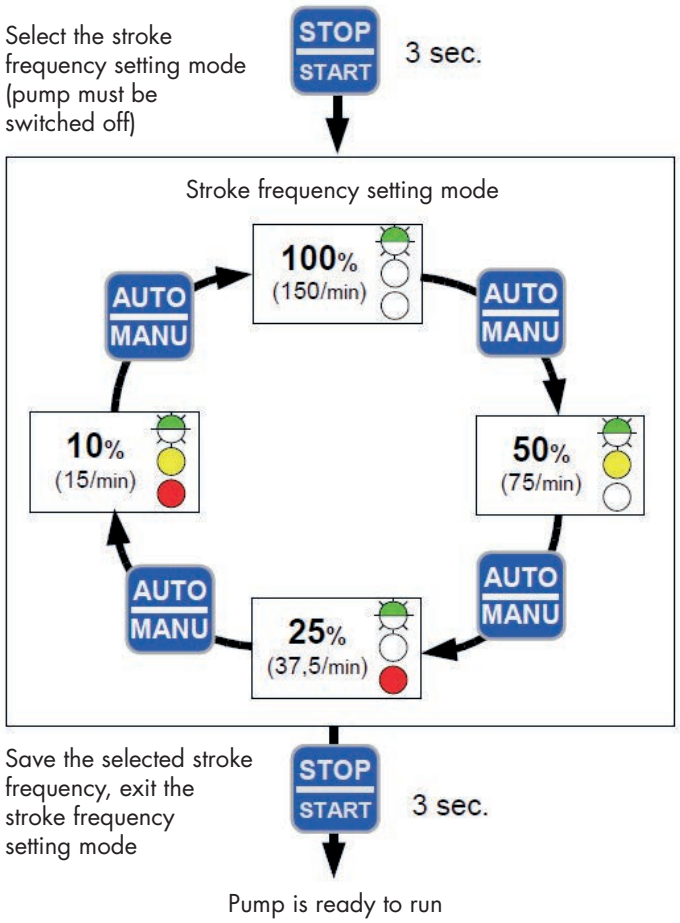
Stroke frequency adjustment

Stroke frequency of the pump can be set to 4 different stages.
In the stroke frequency setting mode, the green LED flashes and the selected stroke frequency is indicated by the yellow and red LEDs.

4-stage stroke frequency setting:

Stroke frequency		Green LED	Yellow LED	Red LED
100 %	(150 strokes/min)	Flashes		
50%	(75 strokes/min)	Flashes	On	
25%	(37,5 strokes/min)	Flashes		On
10%	(15 strokes/min)	Flashes	On	On

To select the stroke frequency, use the keys as described in the following diagram:



ATTENTION

Stroke frequency can only be changed while the pump is switched off.

Configuring the level input

When leaving the factory, the level input is configured as follows:

- Pre-alarm = NO (closing when floating down)
- Dry run = NO (closing when floating down)

The level input can be freely configured. In the level input setting mode, the yellow LED flashes and the selected configuration is indicated by the green and red LEDs:

Configuration	Pre-alarm / dry run	Green LED	Yellow LED	Red LED
1	NO / NO		Flashes	
2	NO / NC	On	Flashes	
3	NC / NC	On	Flashes	On

Configuration 1

When leaving the factory, this configuration is preset. A 1- or 2-stage level monitoring with “closing when floating down” contacts (pre-alarm and dry run or dry run only) can be connected.

Configuration 2

This configuration must be selected when a 1-stage level monitoring with “opening when floating down” contact (dry run only) is connected.

Configuration 3

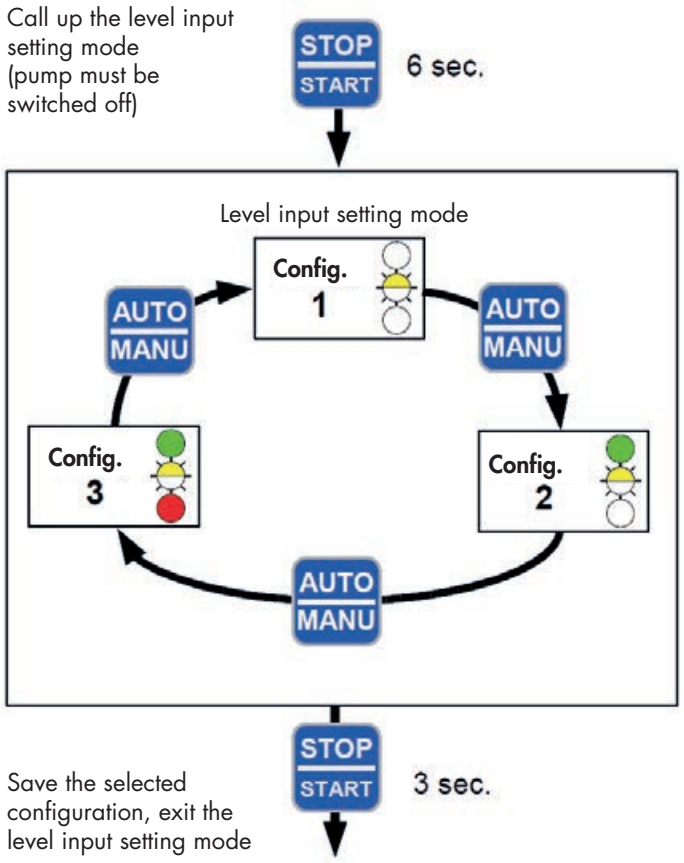
This configuration must be selected when a 2-stage level monitoring with “opening when floating down” contacts (prealarm and dry run) is connected.

ATTENTION

Configuration of the level input can only be performed while the pump is switched off.

OPERATION

To configure the level input, use the keys as described in the following diagram:



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Maintenance and cleaning

The control is maintenance-free. Clean with a moist cloth. Rub dry afterwards.

Decommissioning

- Disconnect device from the power supply.
- Detach electrical connections.
- Take device out of operation.

Disposal

Dispose of correctly and comply with the currently applicable local regulations after shutdown and dismantling.

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