Type series booklet
4040.5/2-10

LevelControl

Level control unit

BasicUnit
CompactUnit
SwitchgearUnit

Product description

LevelControl:

- Can be integrated in an on-site control cabinet (BasicUnit)
- Can be used for controlling and monitoring one or two pumps
- Can be used for tank draining applications
- ATEX-compliant model can be operated in potentially explosive atmospheres

Applications

In waste water engineering and lifting/pumping stations in applications such as drainage, dewatering, water extraction, liquid transport and disposal. Other applications on request.

Level Control can be used with the following pumps:

- Ama-Drainer
- Rotex
- MK
- Ama-Porter
- Amarex N
- Amarex KRT
- Compacta
- Ama-Porter CK
- Other pumps on request

Operating modes

CompactUnit and SwitchgearUnit are equipped with one selector switch (manual-0-automatic) per pump.

On the BasicUnit, selector switches can be connected for every pump.

”0” position: The pump is switched off and non-operational.

”Automatic” position: If the switches are set to ”Automatic”, the pumps will be started and stopped by the control unit as a function of the liquid level.

”Manual” (H) position: The pump can be started up manually by turning the switch to ”manual” mode (non-locking).

Designation

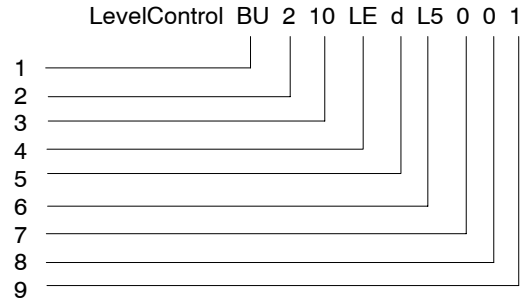


Fig. 1: Designation

1 Type series

2 Number of pumps

3 Maximum output current per pump [A]:
10, 14, 18, 25, 40, 63

4 Sensors:
LE = level switch, analog sensor (4..20 mA)
H03 = pressure sensor for 0 to 3.5 m
H10 = pressure sensor for 0 to 10.5 m
A03 = pressure sensor for 0 to 3.5 m with compressor for bubbler system
A10 = pressure sensor for 0 to 10.5 m with compressor for bubbler system
X1 = 1 level switch in potentially explosive atmosphere
X2 = 2 level switches in potentially explosive atmosphere
X3 = 3 level switches in potentially explosive atmosphere
X4 = 4 level switches in potentially explosive atmosphere

5 Motor starting method:
d = direct starting
sd = star-delta starting

6 Mains type:
L5 = three-phase
L35 = single- or three-phase

7 ATEX functions:
1 = yes
0 = no

8 Field bus (in preparation):
L = Lonbus
P = Profibus
M = ModBus
0 = without

9 Language version
1 = German, English, French, Dutch

Ordering key

The information listed below is required for ordering. Only one option can be selected for each feature. The codes of the individual options are reflected in the unit designation (see left):

Type series BU

Order information	Options
Number of pumps	-
Maximum output current per pump [A]	-
Sensors	LE, H03, H10
Motor starting method	-
Mains type	-
ATEX functions	0
Field bus	0
Language version	1

Table 1: Ordering key for type series BU

Type series CU

Order information	Options
Number of pumps	1, 2
Maximum output current per pump [A]	10
Sensors	LE, H03, H10, X1, X2, X3, X4
Motor starting method	d
Mains type	L35
ATEX functions	0, 1
Field bus	0
Language version	1

Table 2: Ordering key for type series CU

Type series SU

Order information	Options
Number of pumps	1, 2
Maximum output current per pump [A]	10, 14, 18, 25, 40, 63
Sensors	LE, H03, H10, A03, A10, X1, X2, X3, X4
Motor starting method	d, sd
Mains type	L5
ATEX functions	0, 1
Field bus	0
Language version	1

Table 3: Ordering key for type series SU

Technical data

Characteristics		LevelControl BU	LevelControl CU	LevelControl SU
Rated voltage		3~ 400 V AC +/- 10 %, 1~ 230 V AC	3~ 400 V AC +/- 10 %, 1~ 230 V AC	3~ 400 V AC +/- 10 %, 1~ 230 V AC
Mains frequency		50/60 Hz	50/60 Hz	50/60 Hz
Rated insulation voltage		500 V AC	500 V AC	500 V AC
Rated power per motor		with internal current transformers: up to 4 kW	Direct starting: up to 4 kW	Direct or star-delta starting: 0.37 to 22 kW.
		with external current transformers: any power		
Rated current per motor		with internal current transformers: max. 10 A	max. 10 A	1.0 to 63 A
		with external current transformers: any current	max. 10 A	1.0 to 63 A
Enclosure		IP 20	IP 54	IP 54
Material	Housing	Plastic	Plastic	Sheet steel
	Housing cover	PBT, glass fibre reinforced	Plastic	Sheet steel

Table 4: Technical data

Functions

Control

- Tank drainage
- Even distribution of pump operating hours
- Automatic pump changeover after every pump start or as a function of operating hours
- Pump start-up and shutdown in response to service demand
- Pump changeover in the case of a pump fault
- Periodic check of operation
- Sequenced starting/stopping if both pumps have to be started or stopped, to prevent pressure surges and reduce starting currents
- Freely selectable automatic re-start after fault
- Adjustable after-run time (slurp mode, forced drainage)
- Variable stop delay to prevent deposits in the tank

Tank drainage can be realized by means of level switches or an analog sensor.

Monitoring

- Internal mains-independent alarm buzzer
- High-water alert
- Operational availability
- General "System Operational" message
- General fault message
- Phase monitoring
- Overload detection per pump
- Thermal monitoring of pump motors
- Sensor fault / Live zero
- Fault / Warning per pump
- Low-load detection
- Archiving of data of the last 30 faults
- Monitoring of service interval

Information displayed

- Water level
- Alerts and warnings in plain text
- "Pump operational" and "Pump running" messages per pump
- Status information
- Operating hours per pump
- Operating hours per system
- Motor current per pump
- Mains voltage
- Mains frequency
- Effective power per pump
- Rotary field direction of mains supply
- Starts per pump
- Parameterization / Settings
- Electronic name plate
- Languages: German, English, French, Dutch

Operation

Operating option	BU	CU	SU
KSB control panel	optional	x	x
RS232 interface	x	x	x
Selector switch	site-supplied	x	x
Master switch	site-supplied	without	x

Table 5: Operating options

Communication

RS232 interface

Accessories/Options

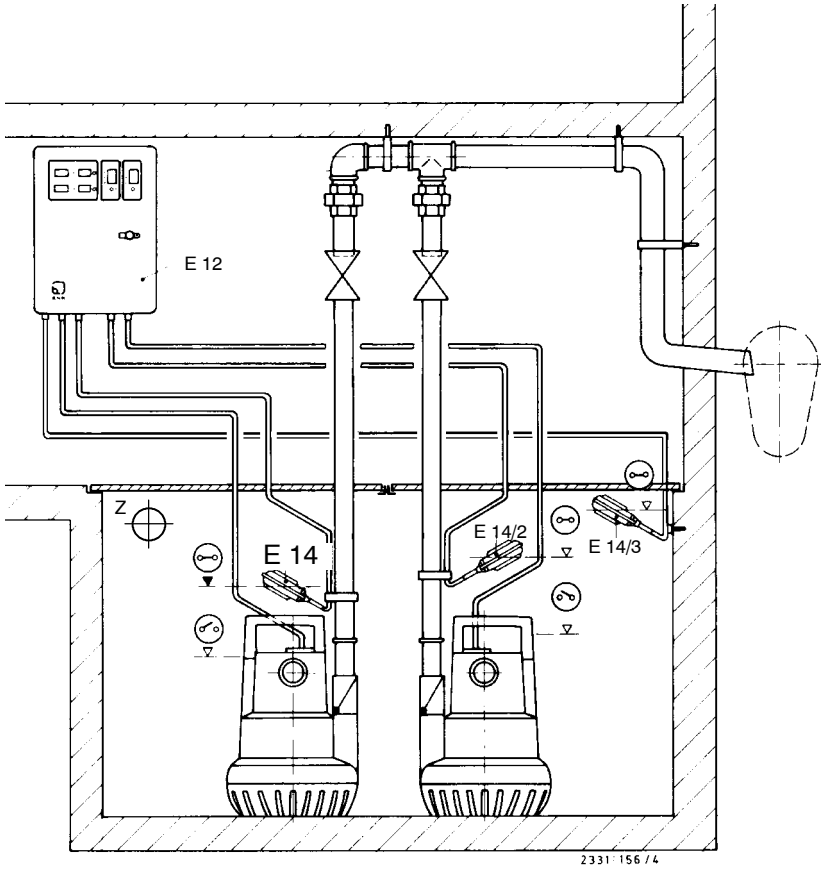
Accessories/Option	BU	CU	SU
Control panel	x	—	—
Ammeter 6, 10, 15, 25 or 40 A	—	—	x
Voltmeter with integrated changeover switch 500 V	—	—	x
Flashlight 12 V DC, IP 65	—	—	x
Horn 12 V DC, IP 33	—	—	x
PTC thermistor relay with automatic reset	—	—	x
Control cabinet heating	—	x	x

Table 6: Accessories/Options

Application example: Waste water disposal, level control via three float switches

Ama-Drainer 301 NE/303 NE with LevelControl

- Disposal of heavily contaminated, fibre-containing waste water in an industrial business.
- Two submersible motor pumps installed in a site-supplied sump are controlled as a function of the liquid level in the sump.
- Control of the Ama-Drainer pumps is effected by LevelControl.
- Two float switches detect base load and peak load conditions. A third float switch is used to detect high water.



E12	Control unit
E14	Float switch Base load
E14/2	Float switch Peak load
E14/3	Float switch High water
Z	Inflow

Fig. 2: Ama-Drainer pumps with LevelControl

Operating principle in automatic mode

- The fluid to be handled flows into the pump sump. When the fluid reaches the start-up level of the "base load" float, pump 1 is started up.
- When the liquid level drops again and falls below the stop level of the "base load" float, pump 1 is stopped.
- As the liquid level rises again, the start-stop cycle starts again. This time, however, pump 2 is started up (pump changeover), provided both selector switches have been set to "automatic" mode. Pump changeover is effected after each switching cycle.

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