ELECTRONIC SCALE ELIMINATOR

Luca

POWEL ANTICA

ELECTRONIC SCALE ELIMINATOR

A M
LEVEL

Anti **Ca**⁺⁺ ®

++

DESCALING

POWER

FOR TYPE:

EUV xx Dom
EUV xx D
EUV xx T
EUV xx MI
EUV xx TI
EUV xx AI

AQUATECH ® s.r.o.

Application of *Anti*Ca++ devices

*Anti*Ca++ devices are intended to protect:
- Boilers and heat generators
- Home appliances and domestic hot water heaters, including gas-fired instant hot water systems, eliminating expensive maintenance of heating elements
- Heat exchangers, converters, water distribution systems, heating district distribution systems, generation of hot water, hydronic systems
- Process equipment and systems in which the formation of scale takes place as a result of temperature or pressure changes in hard water.

*Anti*Ca++ Performances

The high performance of AntiCa++ devices in hard water applications is because they are designed, manufactured and installed in consideration of the following parameters:
- chemical composition of the treated water
- the pipe diameter where the device is being installed
- volume of water or water velocity flow through the pipe where the device is being installed
- pipe material where the device is being installed – metal or plastic

Description of *Anti*Ca++ devices

*Anti*Ca++ devices consist of:
- electronic unit
- power coil cable (red)
- circuit for control level based on flow signal from flow meter (EUV xx AI)
- circuit for level switching through timer (EUV xx T a TI)
- circuits for manual switching based on flow (EUV xx MI)
- circuits signals of device functions

Signalling
a) optic signals:
- power ON – red LED diode marked "**POWER**"
- power to coil cable (red) - green LED diode marked "**DESCALING**"
- control based on water volume flow EUV xx AI
- scale change control EUV xx T, a TI

Note.:
  Types EUV 15 Dom to EUV 25 Dom have only visual green LED diode signal marked **"DESCALING"**

b) acoustic signal – type EUV xx MI, TI a AI
- power disconnection – audio ringing
c) contact signal – EUV xx MI, TI a AI
dry open contact on terminal strip for remote signalling or lock out in the event of lost signal of the output circuit

AntiCa++ location and installation

   Install AntiCa++ device upstream of the process device that needs to be protected against scale formation.

   Install the device downstream of open-to-atmosphere water reservoir or tank. **The installation upstream of the water reservoir or tank open to atmosphere is not recommended. The treated water open to atmosphere even for a short period of time loses the benefit of**

treatment and is rendered useless. However the installation of the device in open water circuits downstream of the reservoir or holding tank is beneficial.

In closed water circuits the installation of the device upstream of the holding tank is highly recommended. When the device is installed upstream of the holding tank, then the tank doubles as a sedimentation vessel where the scale separates from the water. The sediments can then be flushed out of the system. However, if thus treated water is not used within 48 hours the treated water reverts to the raw supplied water state and needs to pass again through AntiCa++ device to protect the system.

If in doubt of the device placement in the systems consult with the manufacturer or his representative.

Basic requirements:

Before installing the device on the designated pipe, determine the hardness of the raw water in pH. Where possible determine the amount of iron (Fe) in the raw water. From the water hardness analysis consult Table 1 below and install the number of coil windings indicated. If the water hardness is greater than 40°dH, then it is necessary to order a special device.

For devices EUV xx Dom, D and T wind the number of coil windings as indicated in Table 1

Total water hardness °dH	<16	16 - 24	24 - 32	32 - 40	> 40
Number of coil windings (2x)	11	12	13	14	15

In case the water hardness cannot be determined then it is recommended to install 2 x14 coil windings.

For devices EUV xx MI, TI and AI wind 2x11 coil windings with the separation distance between coils shown in Table 2 below in metric

DN of piping [mm]	50 - 65	80 - 100	125 - 150	200 - 250	300 - 500
Distance L [mm]	200	250	300	500	800

For devices EUV xx MI, TI and AI wind 2x11 coils windings with the separation distance between coils shown in Table 2 below in imperial units

DIA of piping [in]	2 – 2 $^{1}/_{2}$	3 - 4	5 - 6	8 - 10	12 - 20
Distance L [in]	8	10	12	20	32

For devices EUV xx MI and TI set up the strength of signal:
- in accordance with the table printed on the side panel of the device for water hardness up to 20°dH
- one step up for water hardness between 20 - 30°dH (eg. from 7 to 8)
- two steps up for water hardness between 30 - 40°dH (eg. from 6 to 8)
- for water hardness above 40°dH it is necessary to consult on the settings with the manufacturer or his representative and/or order a special device

Note:
- When the water analysis reveals that the iron (Fe) content is Fe>1 mg/l and pH <6.5 or >8.3 it is necessary to consult on the device settings with the manufacturer or his representative.

Installation:

1. Fasten the device to the wall with the supplied screws at a distance of 1,5 m max from the installed coils on the pipe that is intended for protection.
   - For devices EUV xx MI, TI and AI screw in the plastic hanging eyes supplied.
   - For devices EUV xx T and TI install and connect the timer (when timer is part of the supply).

- For devices EUV xx AI connect to water volume measuring device.

2. From supplied power cable (red), wind on vertical or horizontal straight pipe 2 coils with the number of turns indicated in Table 1 and the distance between them indicated in Table 2. Please note that **both windings must run in the same direction** as shown on the installation diagrams for each type of the device.
   - Secure the start and finish of each coil winding with the supplied wire ties to the pipe so the remaining length of both ends of the remaining power cable (red) are approximately of the same length.

CAUTION!

Wind coils in numbers and direction shown on page 4, Table 1, with the correct distance between coils, Table 2, on a straight pipe following the distances from fixtures or tees shown on Device installation. Follow the recommendation of minimum distance to pipe fittings or tees from the end of the coils that need to be greater or equal to 3 x OD of the pipe where the coils are installed. Pay attention to the fact that the minimum distance to other parallel piping should be 2 x OD minimum.

3. After installing the desired numbers of windings at the correct distance between them, wound in the same direction, secured with cable ties to the pipe, connect the power cable (red), to the plugs on the Device. There is no preference as to the polarization, hence it is not designated which end is plugged into the device's connectors. However pay attention to piping material, "Metal" or "Plastic" on devices EUV DOM, D, T as the proper function of the device is dependent on the type of pipe material on which the coils are installed.
4. Plug the device into an electrical wall outlet. All control LEAD lights on the device will light-up.
5. Program the timers as indicated in the manual for devices EUV xx T and TI.
6. For EUV xx MI and TI program the water meter in accordance with the side panel of the device.
7. Change the setting to position „A" for EUV xx AI device.

Checking the function of *Anti*Ca^{++} device

Considering the fact that AntiCa++ devices change only the physical properties of the treated water (formation of aragonite crystals), the functioning of the device can be determined **indirectly**. If the water hardness upstream and downstream of the installed *Anti*Ca^{++} device is the same as it is downstream of the protected equipment (hot-water heater, exchanger, etc.), no scaling of the equipment takes place.

When the device is installed on older systems that were not protected and scaling has already taken place, then during system de-scaling the hardness of exiting water may be higher than the initial hardness of water entering the system, indicating de-scaling is taking place. It is possible to estimate the intensity of system de-scaling from the difference in hardness of systems outlet and outlet of *Anti*Ca^{++} device. It is possible to regulate the rate of the system cleaning process by changing the level of the *Anti*Ca^{++} device output signal.

If the water hardness exiting the system is lower than that measured after the *Anti*Ca^{++} device, sedimentation in the system has occurred and cleaning of the system must be scheduled.

In cases where the *Anti*Ca^{++} device is installed on an electric hot water boiler that was not protected before and has been in use for some time, the boiler must be de-scaled before the *Anti*Ca^{++} device is installed. If de-scaling is not done before installing the device the softened scale may fall down from the boiler's wall and damage the heating elements.

Operation and maintenance of *Anti*Ca^{++} devices.

The devices do not require any special operation or maintenance. Operations consist of routine checking of LED lights, which indicate the functioning of the device. If one of the LED lights is OFF, it may indicate power failure or that the device is not plugged in or that the device is faulty. In the case of a faulty device contact the manufacturer or his representative.

Considerable effort should be made to monitor the system where the *Anti*Ca^{++} device is installed. On older systems where scaling took place before the *Anti*Ca^{++} device installation, the treated water softens the scaling and in time may restore the system to its original state. Depending on the severity of system scaling, the loose scale in piping systems with reduced flow velocity can settle in any place and invoke system blockage. Therefore flushing of the system must take place. Install dirt pockets with valves to drains in piping if this was not done in the original installation.

Closed systems with low pressure and low flow should be flushed regularly till the sediments are not visible in flushed water. Aragonite crystals could in this environment produce sediment like powder dissolved in water, thus flushing of the system must take place to remove them.

Technical data of EUV xx Dom devices.

Type	Water Flow		Max. Pipe diameter		Device dimensions		Input [VA]
	[m³/hour]	[USGPM]	inside [mm-inch]	outside [mm]	[mm]	[in]	
EUV 15 Dom	0.1 – 0.3	1.6 – 4.75	15 (1/2")	21	110x70x55	$4^3/_8$ x $2^3/_4$ x 2	2
EUV 20 Dom	0.2 - 0.6	3.17-9.51	20 (3/4")	27	110x70x55	$4^3/_8$ x $2^3/_4$ x 2	2
EUV 25 Dom	0.3 - 0.9	4.75-14.26	25 (1")	34	110x70x55	$4^3/_8$ x $2^3/_4$ x 2	2
EUV 32 Dom	0.4 - 1.4	6.34-22.19	32 (5/4")	42	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 40 Dom	0.8 - 2.3	12.68-36.45	40 (6/4")	48	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 50 Dom	1.2 - 3.5	19-55.47	50 (2")	60	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 65 Dom	2.0 - 6.0	31.7-95.1	65 (2 1/2")	76	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5

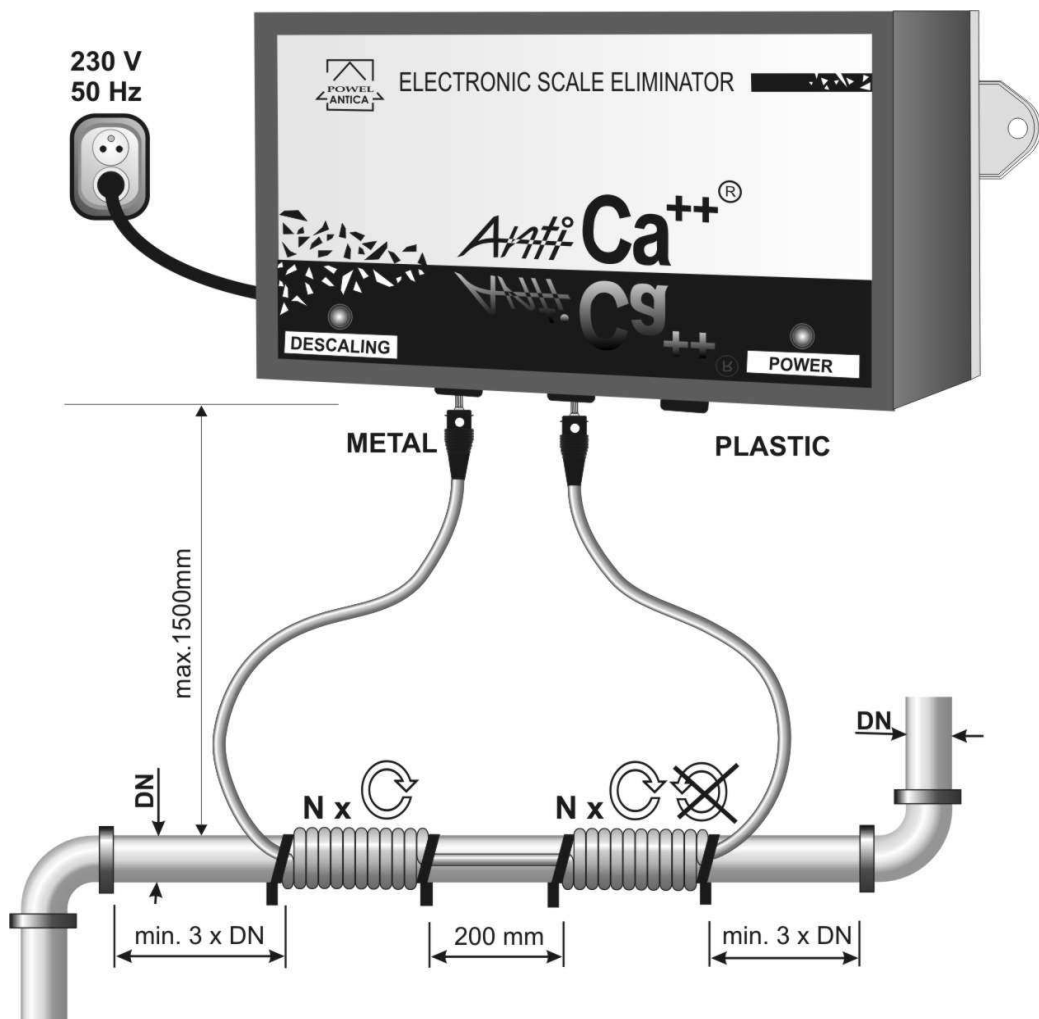## *Installation of EUV xx Dom devices.*
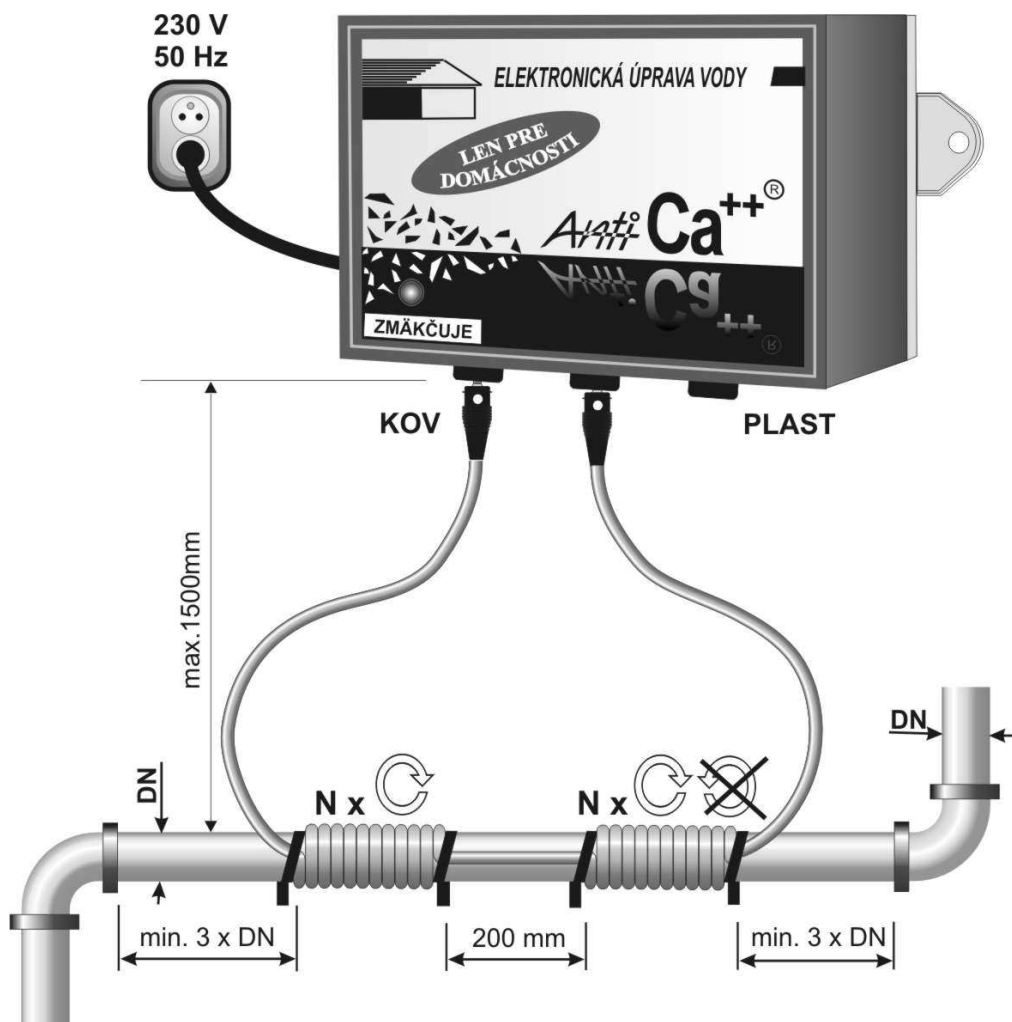
N –numbers of coil windings (see tab. page.4)

Technical data of EUV xx D.

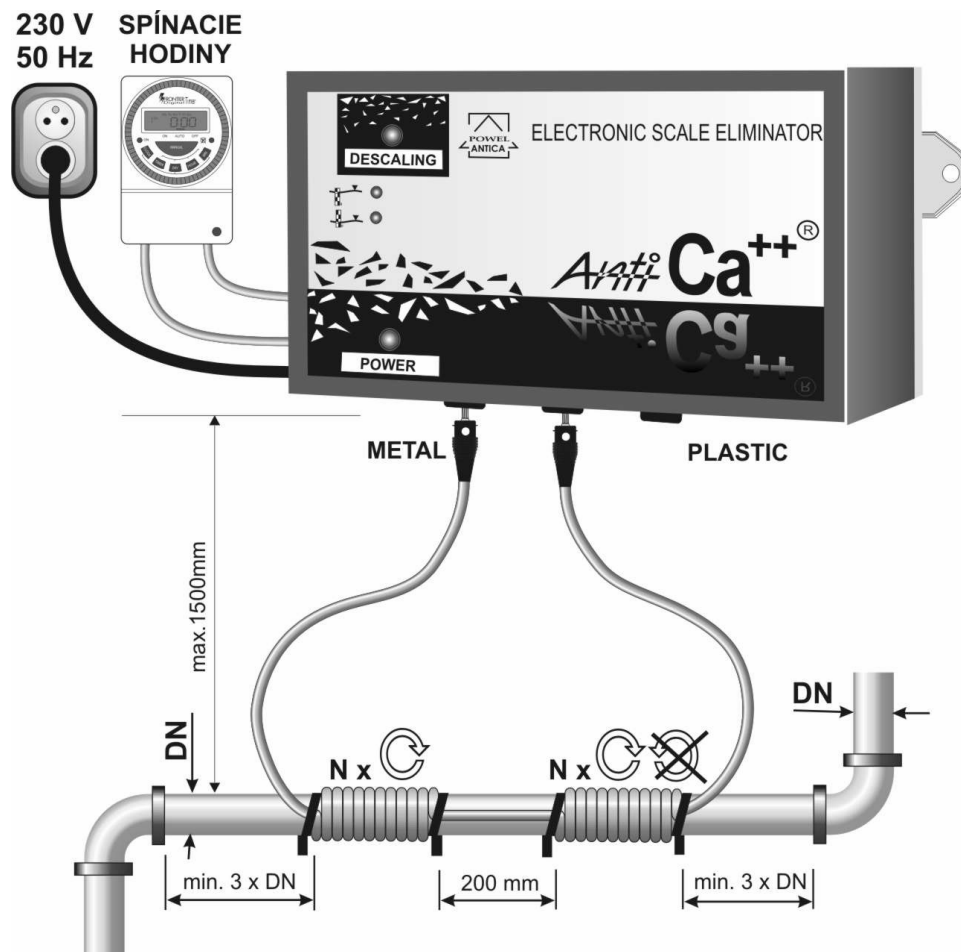| Type	Water Flow		Max. pipe diameter		Device dimensions		Input [VA]
	[m³/hour]	[USGPM]	inside [mm-inch]	outside [mm]	[mm]	[in]	
EUV 10 D	0.1 - 0.45	1.6 - 4.75	10 (3/8")	17	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 15 D	0.3 - 1	4.75 -15.85	15 (1/2")	21	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 20 D	0.6 - 1.8	9.51-28.53	20 (3/4")	27	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 25 D	0.9 - 2.7	14.26-42.79	25 (1")	34	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 32 D	1.4 - 4.4	22.19-69.74	32 (5/4")	42	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 40 D	2.3 - 6.8	36.45-107.78	40 (6/4")	48	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 50 D	3.5 -10.5	55.47-166.42	50 (2")	60	160x96x67	$6^5/_{16}$ x $3^3/_4$ x $2^5/_8$	5
EUV 65 D	6.0 -18.0	95.1-285.3	65 (2 1/2")	76	215x130x82	$8^7/_{16}$ x $5^1/_8$ x $3^1/_4$	6

Installation of EUV xx D.

N –numbers of coil windings (see table, page 4)

Techical data of EUV xx T.

| Type	Water flow		Max. pipe diameter		Device dimensions		Input [VA]
	[m³/hour]	[USGAL]	Internal [mm-inch]	Ext. [mm]	[mm]	[in]	
EUV 32 T	I. 0,.4 -1.4	15.85 - 22.19	32 (5/4")	42	215x130x82	$8^7/_{16}$ x $5^1/_8$ x $3^1/_4$	6
	II. 1.4 -4.4	22.19 - 69.74					
EUV 40 T	I. 0.8 -2.3	12.68 – 36.45	40 (6/4")	48	215x130x82	$8^7/_{16}$ x $5^1/_8$ x $3^1/_4$	6
	II. 2.3 -6.8	36.45 -107.78					
EUV 50 T	I. 1.2 –3.5	19 – 55.47	50 (2")	60	215x130x82	$8^7/_{16}$ x $5^1/_8$ x $3^1/_4$	6
	II. 3.5 - 10.5	55.47 -166.42					
EUV 65 T	I. 2.2 – 6.0	34.87 -95.1	65 (2 1/2")	76	215x130x82	$8^7/_{16}$ x $5^1/_8$ x $3^1/_4$	6
	II. 6.0 - 18	95.1 – 285.3					

Installation of EUV xx T.

N –numbers of coil windings (see table, page 4)

Technical dada of EUV xx MI, TI and AI.

| Type MI, TI, AI	Water Flow		Max. pipe diameter		Device dimensions		Input [VA]
	[m³/hr]	[USGPM]	Internal [mm-inch]	Ext. [mm]	[mm]	[in]	
EUV 50	0.2-11	3.17 -174.35	50 (2")	60	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	8
EUV 65	0.3-18	4.75 -285.3	65 ($2^1/_2$")	76	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	8
EUV 80	0.5-27	7.92 -427.95	80 (3")	89	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	8
EUV 100	0.8-42	12.68 – 665.7	100 (4")	115	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	8
EUV 125	1.4-66	22.19 -1046.1	125 (5")	140	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	10
EUV 150	2.0-100	31.7 -1585	150 (6")	166	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	10
EUV 200	3.2-170	50.72 -2694.5	200 (8")	219	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	10
EUV 250	6.0-270	95.1 -4279.5	250 (10")	273	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	10
EUV 300	8.0-380	126.8 -6023	300 (12")	324	275x220x140	$10^7/_8$ x $8^5/_8$ x $5^1/_2$	10
EUV 400	1.0-680	15.85 -10778	400 (16")	430	370x275x140	$14^5/_8$ x $10^7/_8$ x $5^1/_2$	16
EUV 500	2.0-1100	31.7 -17435	500 (20")	535	370x275x140	$14^5/_8$ x $10^7/_8$ x $5^1/$	16

Installation of EUV xx MI.

L – distance between coil windings (see page 4)

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Installation of EUV xx TI.
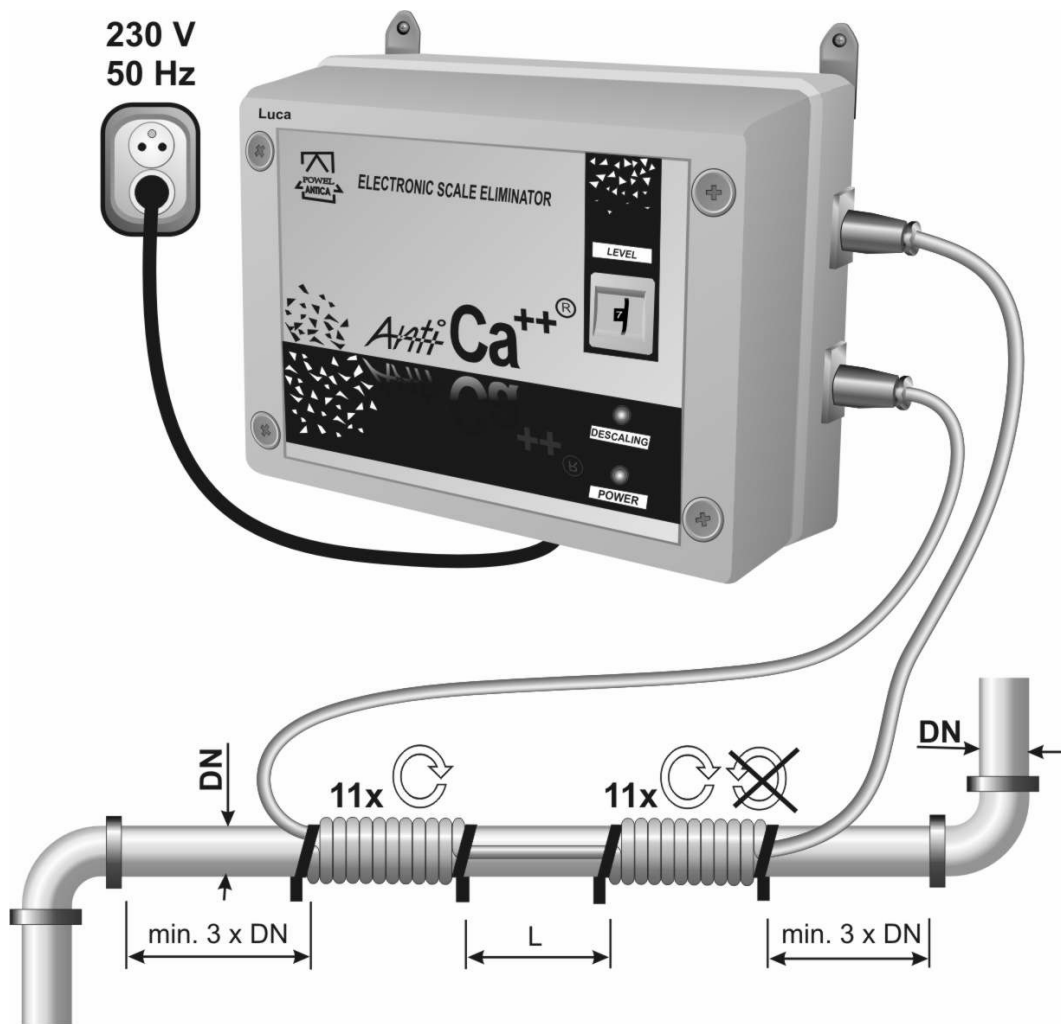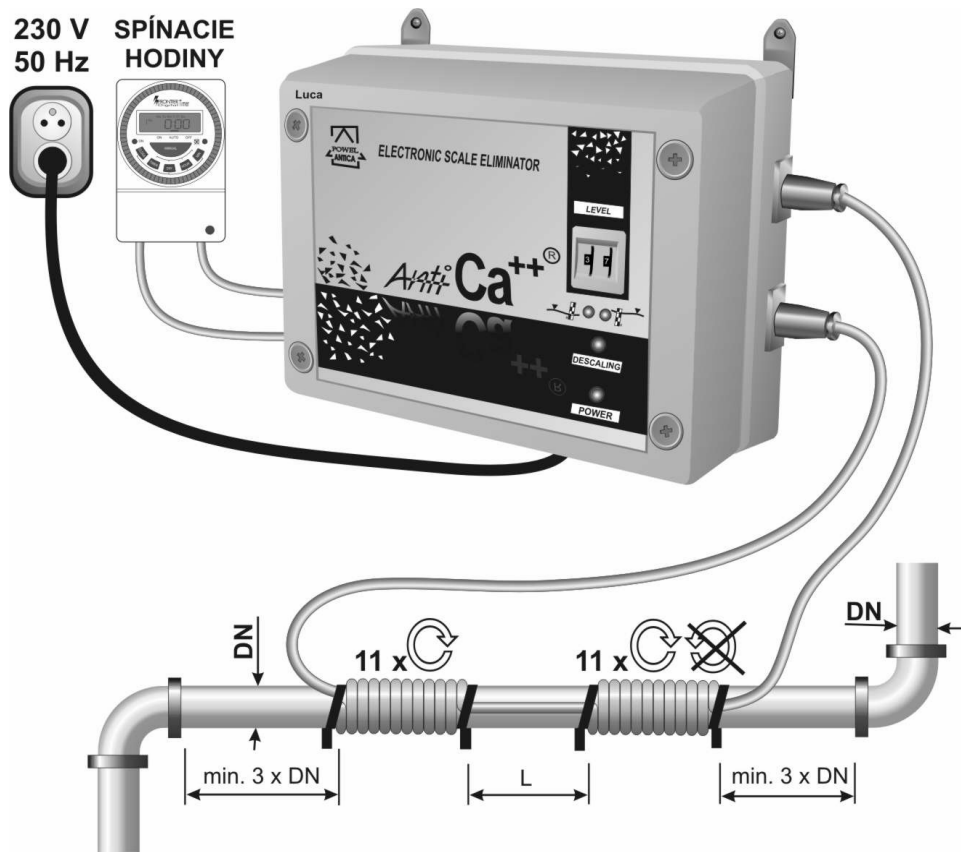
L – distance between coil windings (see. page.4)

Installation of EUV xx AI.
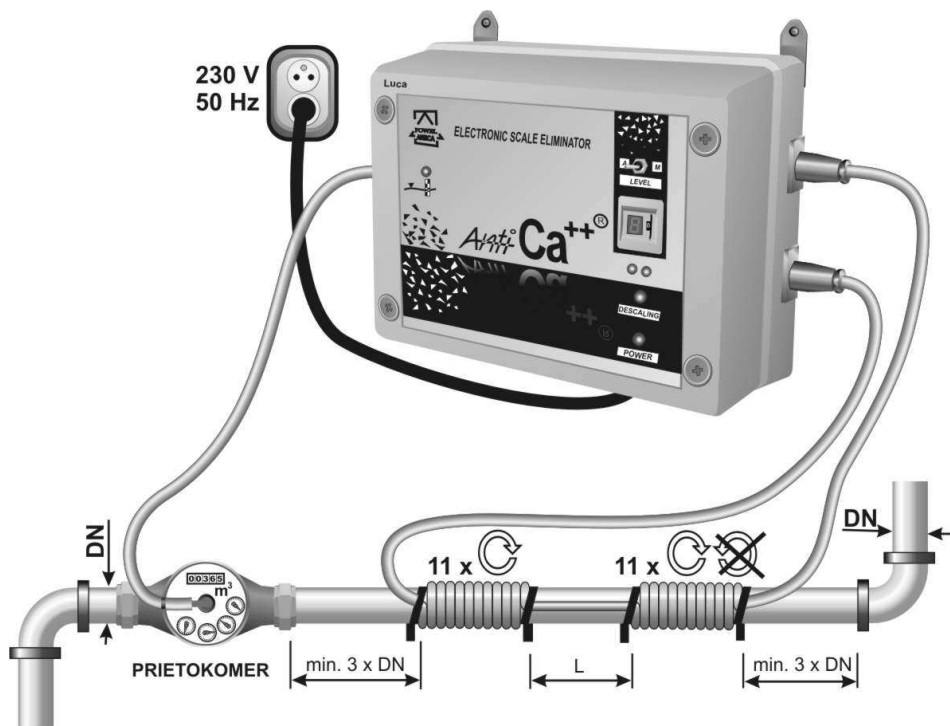
L – distance between coil windings (see. page.4)

Timer TM-6331
(Daily and weekly programming).

Button functions:

CLOCK Indication and time setting
DAY   Day setting
HOUR   Clock setting
MIN   Minutes setting
TIMER Selection of individual time duration On/Off
MANUAL   Manual operation On/Off
R   Accepts all settings and starts the program

Installation:

Take out the screw located on front panel in right corner. The plate with terminals is located there. Affix the plate and connect wires in accordance with schematic. Close the cover and connect to power. Press button "R" to start the device.

Warning:
• The installation must conform to the local electrical code.
• Timer can be used to switch safety voltage in accordance with STN 341010

Timer setting.

Day setting.
When setting time/day depress and hold the CLOCK button and subsequent pushing of the buttons DAY (HOUR, MIN) sets the day of the day of the week, (hour and min).

Setting the timers On/Off (times setting).

1. Press the TIMER button that starts the program of the first timer.
2. Pres the DAY button to set the week day when the timer starts ON.
   It is possible to set:
   • Each day individually
   • All working days
   • Saturday and Sunday only
   • All days... 15 variations altogether.
3. With button HOUR the starting hour is set.
4. MIN button sets the starting minute.
5. Button TIMER is programmed OFF time of the first timer.
6. Repeating the above instruction #2 to #5 set all the desired On/Off times.
7. Second time pressing the TIMER button provides for checking of the program.
8. The programming can be interrupted or finished by pressing the CLOCK button.
9. The timer operates the program only when the timer is set to AUTO. By pressing the AUTO button a second time, the timer switches to ON or OFF display.
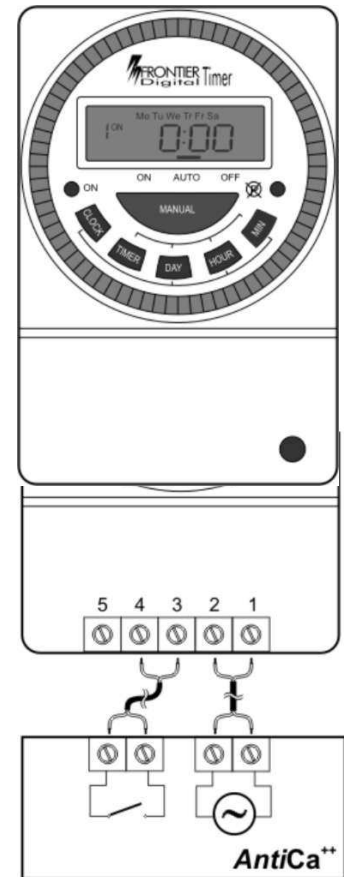
Specifications of timers model TM 6331.

Power	120VACV ,50 – 60 Hz
Max. current	16 A / 250 V alternate. Cosφ=1
	20 A / 125 V alternate. Cosφ=1
Back-up	Battery CR2032
Ambient temperatures	-10 to + 50˚C non-corrosive atmosphere
Number of contacts	16 (8 NO and 8 NC)
Programming	8 timers with 15 modes
Accuracy	± 0,5 sec. / 24 hours
Time	Better than 1 sec

Technical data for digital Volume measurement devices EUV xx AI.

(OPTO OD 01, OD 02.)

Sensor	IR – reflection ray in accordance with DIN 19234	
Specification	Feeder voltage	8,2 V DC (z EUV xx AI)
	Reflection currant	< 1 ,2 mA
	Current without reflection	> 2,1 mA
Constant	DN 40 - 125	1 impulse / litre
	DN 150 - 300	1 impulse / 10 litres

Connecting digital volume counting sensor:

1. Connect middle wire (opto+) shield cable to terminal #4.
2. Shielding (opto-) connect to terminal #1.
When connecting EUV xx AI to non- metal pipe jump terminals #2 and #3.
When connecting EUV xx AI to metal pipe **do not jumper** terminals #2 and 3 (leave them free).

KOVOVÉ POTRUBIE   PLASTOVÉ POTRUBIE
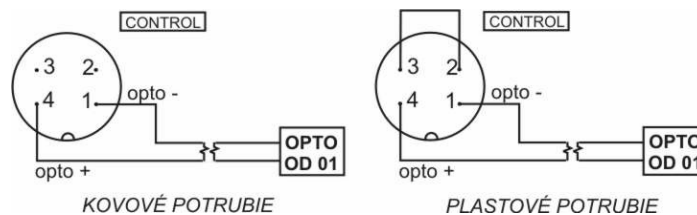
Technical data of current sensors.

When ordering current sensor 0-20 mA or 4-20 mA, specify the characteristic of receiver (graph or table). If the characteristic of the receiver is linear, it is adequate to specify the starting and finishing point (eg. 0 mA=0 m^3 . 20 mA=15 m^3).

Installation of current sensor:

1. Middle wire („ + I „) of shading cable connect to terminal #.4
2. Shading („- I „) connect to terminal #1.
   When connecting EUV xx AI to non-metal pipe jump terminal#2 and #3.
   When connecting EUV xx AI to metal pipe **do not jumper** terminals #2 and #3 (leave them free)

KOVOVÉ POTRUBIE   PLASTOVÉ POTRUBIE
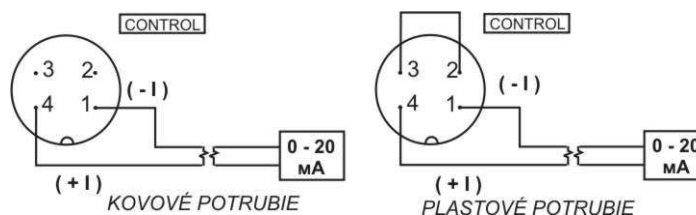
Technical data of *Anti*Ca⁺⁺ devices

Power	120 VACV, 50-60 Hz
Room temperature	+1 to + 50°C
Pipe surface temperature	
EUV xx Dom	max. 70 °C
Other types	max.150 °C
Length of power coil cable (red)	max 1,5 m
Length of power cord	
EUV xx Dom	max 1,5 m
Other types	max 2,2 m
Weight EUV	
EUV 15 - 25 Dom	0,5 kg
EUV 32 - 65 Dom **EUV 15 - 80 D**	1 kg
EUV 32 – 65 T	2,5kg
EUV xx MI, TI AI	from 5 kg and above
Input EUV	2 – 16 VA depending on type of device
EUV 15 - 50 Dom	2 VA
EUV 65 - 65 Dom **EUV 10 – 50 D**	5 VA
EUV 65 - 80 D **EUV 32 T - 65 T**	6 VA
EUV 50 – 100 MI, TI, AI	8 VA
EUV 125 – 300 MI, TI, AI	10 VA
EUV 400 – 500 MI, TI, AI	16 VA
Contact signal functions	
Load on contact relay:	15 W (ohm load, max 1A)
Max voltage at terminals:	125 V
Pulsation current sensor transmitter	
Input voltage	8,2 V DC (z EUV xx AI)
Reflection power	< 1 ,2 mA
Power without refection	> 2,1 mA
Constant DN 50 – DN 125	1 impulse / litre
Constant DN 150 – DN 300	1 impulse / 10 litres
Constant DN 300 – DN 500	1 impulse / 100 litres
Digital volume counting sensor	Specify sensor's characteristic
Current without flow	0 mA (4 mA)
Current at max. flow	20 mA