COMPREHENSIVE
LEAK DETECTION SYSTEM

RATMON

| Product		District		System		Function		Pipe		Working modes		Page
		Heating	Cooling	Impulse	Resistance	Detection	Location	Steel	Plastic/Pex	Remote	Portable	
	RAT-2	X		X	X	X		X		X		2
	RAT-2b	X			X	X	X	X		X		4
	RAT-Combo	X	X	X		X	X	X	X	X		6
	ILA 1.0	X	X	X		X	X	X	X	X		8
	MEGALOC-1/1b	X	X	X	X	X	X	X	X		X	10
	SMARTLOC-1	X	X	X	X	X	X	X	X		X	12
	SMARTBOX-1	X	X	X			X	X	X		X	14
	SAM-1	X	X	X	X	X				X		15
	MSC-1 sensor cable	X	X	X		X	X	X	X			18

www.RATMON.co.uk

RATMON
Remote monitoring.

RATMON is the leak detection system, that carries out 24/7 remote supervision over pre-insulated pipe network. Installed detectors send automatically to the server all measuring data, thanks to which the operator is kept informed about the state of the network and about the possible occurrence of an alarm. The operator has access to the system from any place with internet access. In the event of detecting the leak system sends automatically alarm notification to network supervisor.
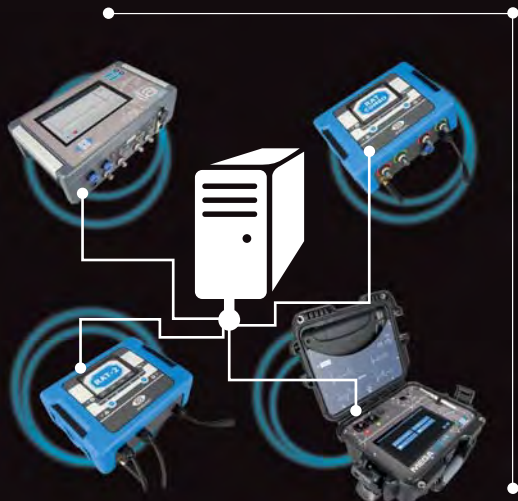
SYSTEM DETAILS:

Automated data transfer from detector to the server
Full data analysis for selected pipe loop
Automated analysis of TDR curve
Alarm notifications by SMS, e-mail
Configuration of alarm thresholds and notifications
Data visualisation by chart or table
History of measurements
Drawing of pipe loops on the google.maps
Printing of documentation and reports
Inventory of network elements
Access to the system from any place
Access to the system regardless the operating system
Monitoring and configuration of detectors

RAT-2

RAT-2
Leak detector for remote monitoring of district heating network.
Leak detection by insulation and loop resistance measurements.

General information:	Leak detection in impulse and resistance networks
Application:	District heating

Technical specification: Main functions:	Type of measurement	Specification
	Insulation resistance	0 - 200 MΩ
	Loop resistance	0 - 100 kΩ
	Galvanic voltage	0 - 2000 mV
	Continuous loop control	Triggering of detector by breaking of loop
	Control of connection to the pipe	Resistance measurement between supply and return pipe

Insulation resistance measurement:	Test range	0 - 200 MΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy up to 1 MΩ	+/- (2% of m. + 8 digits)
	Accuracy over 1 MΩ	+/- (5% of m. + 8 digits)
	Measurement in both polarities	

Loop resistance measurement:	Test range	0 - 100 kΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy	+/- (2% of m. + 8 digits)
	Measurement in both polarities	

Galvanic voltage:	Test range Accuracy	0 - 2000 mV +/- 5%
Communication:	2g/CAT-M/NB-IoT/LAN/MODBUS (RS485)/MODBUS TCP/IP (LAN)/RELAY	
Number of channels:	2 or 4	
Power supply:	12 V DC / 120 - 240 V AC	
Housing:	IP65	
Dimensions:	200 x 150 x 75 mm	
Weight:	0,64 kg	

Software:

RATMON - web application for remote data aquisition and analysis of test results as well as configuration and operation of detectors.

RATMON MOBILE - Android and iOS application for reviewing of pipe loops state.

RAT MANAGER - PC software for configuraton and operation of detectors.

Scope of delivery:

RAT-2 device with DIN mounting bracket

12 V AC/DC power adapter

GSM antenna (for devices with GSM module)

Optional accessories:

DESCRIPTION	INDEX
Battery module	**BAT-1**
External GSM antenna	**ANT-1**
Basic connection box, two loops	**BOX-1**
Constant impedance connection box, one loop	**BOX-3**
Five-core wire connetion box, two loops	**BOX-4**
BNC/UHF connection box, two loops	**BOX-5**
Hermetic power adapter	**ZH-1**
Grounding bracket	**GND-1**
External cabinet with NEMA certificate	**SK-1**

RAT-2b

RAT-2b
**leak detector for remote monitoring
of district heating network.**
Leak detection and location in resistance network.

General information:	Leak detection and location in resistance network	
Application:	District heating	

Technical specification: Main functions:	**Type of measurement**	**Specification**
	Insulation resistance	0 - 200 MΩ
	Loop resistance	0 - 100 kΩ
	Galvanic voltage	0 - 2000 mV
	Continuous loop control	Triggering of detector by breaking of loop
	Control of connection to the pipe	Resistance measurement between supply and return pipe

Insulation resistance measurement:	Test range	0 - 200 MΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy up to 1 MΩ	+/- (2% of m. + 8 digits)
	Accuracy over MΩ	+/- (5% of m. + 8 digits)
	Measurement in both polarities	

Loop resistance measurement:	Test range	0 - 100 kΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy	+/- (2% of m. + 8 digits)
	Measurement in both polarities	

4

Galvanic voltage:	Test range	0 - 2000 mV
	Accuracy	+/- 5%

Leak location in resistance pipe network:	Accuracy	+/- 2 m +/- 0,2% of measured length
	Location threshold	< 2 MΩ
	Test results displayed in RATMON system	
	Test results displayed in % or meters	

Communication:	2g/CAT-M/NB-IoT/LAN/MODBUS (RS485)/MODBUS TCP/IP (LAN)/RELAY
Number of channels:	2 or 4
Power supply:	12 V DC / 120 - 240 V AC
Housing:	IP65
Dimensions:	200 x 150 x 75 mm
Weight:	0,64 kg

Software:

RATMON - *web application for remote data aquisition and analysis of test results as well as configuration and operation of detectors.*

RATMON MOBILE - *Android and iOS application for reviewing of pipe loops state.*

RAT MANAGER - *PC software for configuraton and operation of detectors.*

Scope of delivery:

RAT-2 device with DIN mounting bracket

12 V AC/DC power adapter

GSM antenna (for devices with GSM module)

Optional accessories:

DESCRIPTION	INDEX
Battery module	**BAT-1**
External GSM antenna	**ANT-1**
Basic connection box, two loops	**BOX-1**
Five-core wire connetion box, two loop	**BOX-4**
BNC/UHF connection box, two loops	**BOX-5**
M16 6pin connection box, two loops	**BOX-6**
M16 6pin connection box, one loops	**BOX-8**
Hermetic power adapter	**ZH-1**
Grounding	**GND-1**
M16 6PIN measuring adapter	**ZM-16**
External cabinet with NEMA certificate	**SK-1**

RAT-Combo

RAT-Combo
diagnostic device for leak detection and location in impulse pipe network.
Leak detection is done by resistance measurements and fault location by TDR technology.

General information:	Leak detection and location in impulse network
Application:	District heating and cooling

Technical specification: Main functions:	Type of measurement	Specification
	Insulation resistance	0 - 200 MΩ
	Loop resistance	0 - 100 kΩ
	Galvanic voltage	0 - 2000 mV
	Continuous loop control	Triggering of detector by breaking of loop
	Control of conection to the pipe	Resistance measurement between supply and return pipe

Insulation resistance measurement:	Test range	0 - 200 MΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy up to 1 MΩ	+/- (2% of m. + 8 digits)
	Accuracy over 1 MΩ	+/- (5% of m. + 8 digits)
	Measurement in both polarities	

Loop resistance measurement:	Test range	0 - 100 kΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy	+/- (2% of m. + 8 digits)
	Measurement in both polarities	

| Galvanic voltage: | Test range | 0 - 2000 mV |
| | Accuracy | +/- 5% |

TDR (relfectometer) module:	Type of measurement	Specification
	Test range	up to 10 km (by VOP 100%)
	Pulse rate	1 - 70 ns
	Gain adjustment	x 30
	Velocity of propagation (VoP)	40 - 100%
	Possibility to select any part of the chart	0 - 10 km
	Accuracy	+/- 0,01% of range +/- 1 px
	Noise filtration	50/60 Hz; 20 MHz, 100 MHz, 200 MHz, 350 MHz, 650 MHz, 750 MHz, 900 MHz
	Selectable output impedance	42 Ω, 50 Ω, 75 Ω, 100 Ω

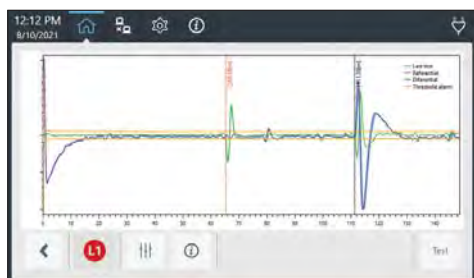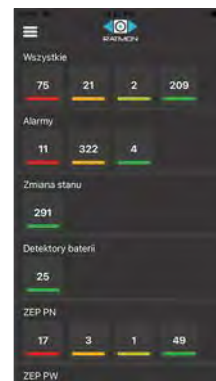| Communication: | GSM / LAN / RELAY |
Number of channels:	2
Power supply:	12 V DC / 120 - 240 V AC
Housing:	IP65
Dimensions:	200 x 150 x 75 mm
Weight:	0,64 kg

Software:

RATMON - *web application for remote data aquisition and analysis of test results as well as configuration and operation of detectors.*

RATMON MOBILE - *Android and iOS application for reviewing of pipe loops state.*

RAT MANAGER - *PC software for configuraton and operation of detectors.*

Scope of delivery:

RAT-COMBO device with DIN mounting bracked, 2 BNC cable and boxes

12 V AC/DC power adapter

GSM antenna (for devices with GSM module)

Optional accessories:

DESCRIPTION	INDEX
Battery module	**BAT-1**
External GSM antenna	**ANT-1**
Constant impedance connection box, one loop	**BOX-3**
3-wire sensor cable connection box, 2 alarm loops	**BOX-7**
MSC-1 connection box, two loops	**BOX-9**
Grounding	**GND-1**
External cabinet with NEMA certificate	**SK-1**

ila 1.0
LEAK DETECTION

ILA 1.0
Leak detector and fault locator in pre-insulated pipes.
Detection and location is done by TDR technology.

General information:	Leak detection and location in pre-insulated pipes
Application:	District heating and cooling
Technical specification: **Measuring range:**	6000 m sensor cable / 3000 m pipe *(MSC-1)* 2000 m sensor loop / 1000 m pipe *(other manufacturers)*
Channels:	2 - looped sections 4 - not looped sections
Accuracy:	+/- 0,1% of range, +/- 2 m
Display:	LCD touch screen
Alarm indication:	Visualisation on screen, buzzer, LED light
Multileak detection:	YES
Cable type and application:	District cooling - MSC-1 sensor cable District heating, steel pipes - cooper wires District heating, plastic pipes - MSC-1 sensor cable
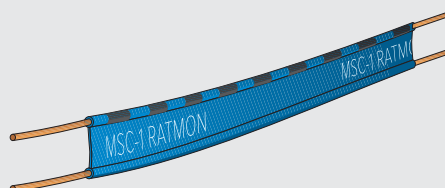
Leak identification:	Fault detection and location (leak/break/short)
BMS & SCADA:	Yes
Memory (fault & alarm date):	Yes
External communication:	Ethernet (RJ 45) GPRS Communication with PC by USB or wireless Relay (BMS, SCADA) Communication with external systems by MODBUS TCP/IP Detector positioning and status on Google Maps Communication with RATMON system
Power supply:	12 V DC / 120 - 240 V AC
Working temperature:	-20°C / +70°C
Battery back-up:	Accumulator
Housing:	IP54/IP65 (in external cabinet)
Dimensions:	300 x 170 x 90 mm
Weight:	3,2 kg

Software:

RATMON - *web application for remote data aquisition and analysis of test results as well as configuration and operation of detectors.*

RATMON MOBILE - *Android and iOS application for reviewing of pipe loops state.*

ILA - *integrated software.*

Scope of delivery:

ILA device

Power supply: 12 V DC / 120 - 240 V AC

Optional accessories:

DESCRIPTION	INDEX
External GSM antenna	**ANT-1**
3-wire sensor cable connection box, 2 alarm loops	**BOX-7**
MSC-1 connection box, two loops	**BOX-9**
Sensor cable	**MSC-1**
Mounting bracket	**UM-1**
External cabinet	**SK-1**

MEGALOC - 1

DIAGNOSTIC DEVICE
FOR LEAK DETECTION AND LOCATION
IN IMPULSE AND RESISTANCE
PIPE NETWORK

MegaLoc- 1/1b

Portable diagnostic tester for fault detection and location, designed to work in difficult job site terrain.

Device enables fault detection and location in verious network, including impulse and resistance. Compatible with RATMON system.
Test results can be saved in internal memory or to be sent to RATMON system.

General information:	Fault location in impluse network by TDR technology
	Leak location in resistance network
	Foam insulation resistance test
	Loop resistance test
	Touch screen
	Water and shock resistant housing
	Battery powered
	Data saving in internal memory or in RATMON system
	Housing IP65

Technical specification:

Fault location by TDR technology:		
	Test range	up to 10 km (by VOP 100%)
	Pulse rate	1 - 70 ns
	Gain adjustment	x 30
	Velocity of propagation (VoP)	40 - 100%
	Possibility to select any part of the chart	0 - 10 km
	Accuracy	+/- 0,01% range +/- 1 px
	Noise filtration	50/60 Hz; 20 Hz; 100 MHz, 200 MHz, 350 MHz, 650 MHz, 750 MHz, 900 MHz
	Selectable output impedance	42 Ω; 50 Ω; 75 Ω; 100 Ω

Leak location in resistance pipe network: (option - MegaLoc - 1b)	Measurement accuracy	+/- 2 m +/- 0,2% of the range
	Location threshold	< 2 MΩ
	Test results displayed in % or meters	

Insulation resistance measurement:	Test range	0 - 200 MΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy up to 1 MΩ	+/- (2% of m. + 8 digits)
	Accuracy over 1 MΩ	+/- (5% of m. + 8 digits)
	Measurement in both polarities	

Loop resistance measurement:	Test range	0 - 100 kΩ
	Test voltage	24 V
	Test current	max. 100 mA
	Accuracy	+/- (2% of m. + 8 digits)
	Measurement in both polarities	

Galvanic voltage:	Test range	0 - 2000 mV
	Accuracy	+/- 5%

Dimensions:	290 x 280 x 140 mm
Weight	3,2 kg

Software:

RATMON - *web application for remote data aquisition and analysis of test results as well as configuration and operation of detectors.*

RATMON MOBILE - *Android and iOS application for reviewing of pipe loops state.*

RAT MANAGER - *PC software for configuraton and operation of detectors.*

Scope of delivery:

MEGALOC-1 device

Magnetic pipe connector

Power supply: 12 V DC / 120 - 240 V AC

Measuring wires

Pendrive

Aligator clips

Carry case

Optional accessories:

DESCRIPTION	INDEX
M16 6pin measuring adapter	**ZM-16**

SMARTLOC-1

PORTABLE TESTER OF ALARM LOOPS IN PRE-INSULATED NETWORKS

FUSION mobile

Smartloc-1

Dedicated diagnostic device for monitoring alarm systems in any type of pre-insulated networks including impulse and resistance.

Designed for harsh working conditions
It performs well during the construction of the network and during its operation.
Compatible with mobile application and RATMON system.

General Information:

Measurement of alarm loop continuity resistance
Loop length determination
Foam insulation resistance measurement
Moisture level given in Ω and degrees MH
Preset leakage localization in resistive networks
Battery power supply
Easy-to-read display
Intuitive operation with large keyboard buttons
Automatic measurement evaluation
Ergonomic housing
Wireless communication
Protection class IP65
Cooperation with dedicated mobile application and RATMON system
GPS coordinates recording
Report for each measurement point (muffs)
Possibility to add photos and comments
Inspection of the connection of measuring wires to the pipe

Technical specification: **Insulation resistance measurement:**	
Test range	0 - 100 MΩ (24 V)
Test voltage	24 V optionally 250 V, 500 V
Test current	max. 10 mA (2 mA at 500 V)
Accuracy up to 1 MΩ	+/- (2% of m. + 8 digits)
Accuracy over 1 MΩ	+/- (5% of. m. + 8 digits)
Measurement in both polarities	

Loop resistance measurement:	Test range	0 - 20 kΩ
	Test voltage	max. 24 V
	Test current	max. 10 mA
	Accuracy	+/- (2% of m. + 8 digits)
	Measurement in both polarities	
Galvanic voltage:	Test range	0 - 2000 mV
	Accuracy	+/- 5%
Dimensions:	200 x 100 x 60 mm	
Weight:	0,6 kg	

Software:

FUSION MOBILE - Android and iOS application for wireless communication with the device, as well as management of results and generation of reports.
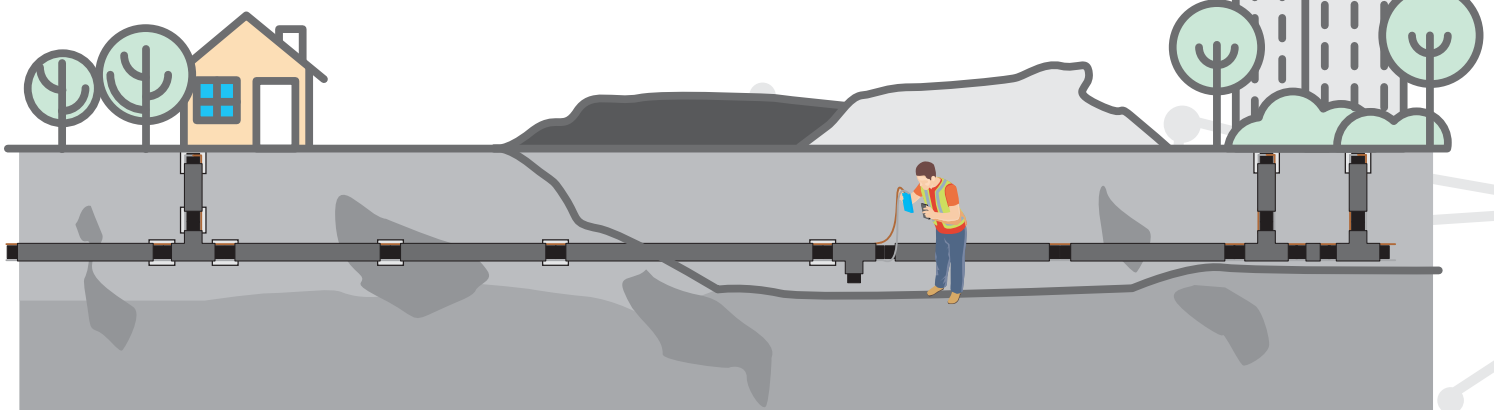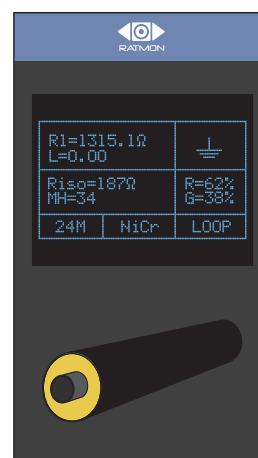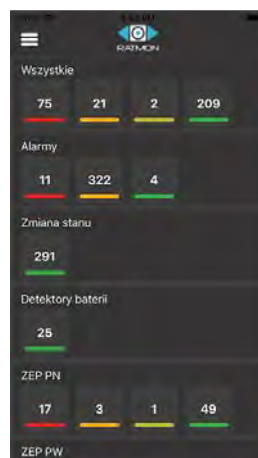
Scope of delivery:

SMARTLOC-1 device

Magnetic pipe connector

Batteries

Measuring wires 4 pcs

Aligator clips 2 pcs

Suitcase

SMARTBOX-1

PORTABLE SIMULATOR OF ALARM NETWORK STATES

SMARTBOX-1
A device that allows remote simulation of network conditions for easier fault location. Thanks to the possibility of remote control, there is no need for an additional person at the place where the simulation is performed.

General Information:

Remote control of the device using a smartphone
Simulations: wire-to-pipe short-circuit, loop break, looping, check for correct wire connection
Network and battery power supply
Built-in GSM modem
Heavy-duty case

Standard equipment:

SMARTBOX-1
Two magnetic connector for pipes
Case
Power supply
Smartphone app for remote control *(Android, IoS)*

8 wires 1,5 m
4 crocodiles
2 USB cables
SIM card *(2 years included in the price of the device)*

Software:

MANHOLES

CHAMBERS

TANKS

TEMPERATURE

OTHER SENSOR

SAM-1

IN 1 IN 2 IN 3 IN 4 IN 5
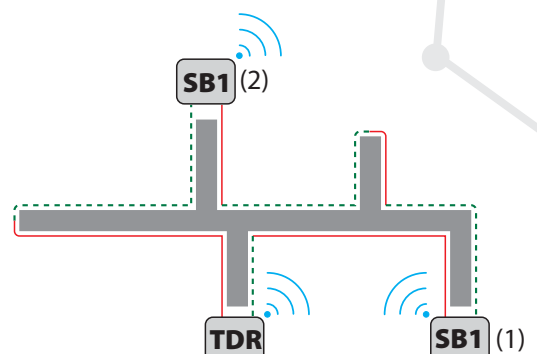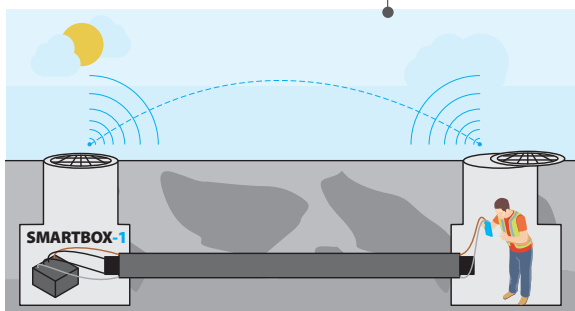
SAM-1 SMART MONITORING

SAM-1 it is standalone alarm unit to monitor remotely following chambers or tanks conditions: water levels, manhole opening, temperature, humidity etc.

SAM-1 can be also utilized as potential leak detector for traditional/channel pipe network *(non-pre-insulated pipe networks)*. All data collected by the device are sent via IoT technology to the RATMON system. Thanks to opened MQTT protocol data can be also sent directly to any external system.

Specification:
· Up to 5 independent inputs/sensors
· 5 years of working on battery
· Temperature measurement: -55°C to +135°C
· Humidity measurement: 0 - 100% RH
· Opened MQTT protocol to communicate
  with any external systems
· Communication: IoT
· Compatible with RATMON system
· Housing: IP67
· Dimensions: 190 x 130 x 60 mm
· Weight: 0,25 kg

Sensors:

Manhole opening S-2

Flooding sensor S-1

Temperature sensor TEMP-1

Additional 4-20 mA input

CAT-M1/NB IoT

SAM-1

RATMON

www.ratmon.co.uk
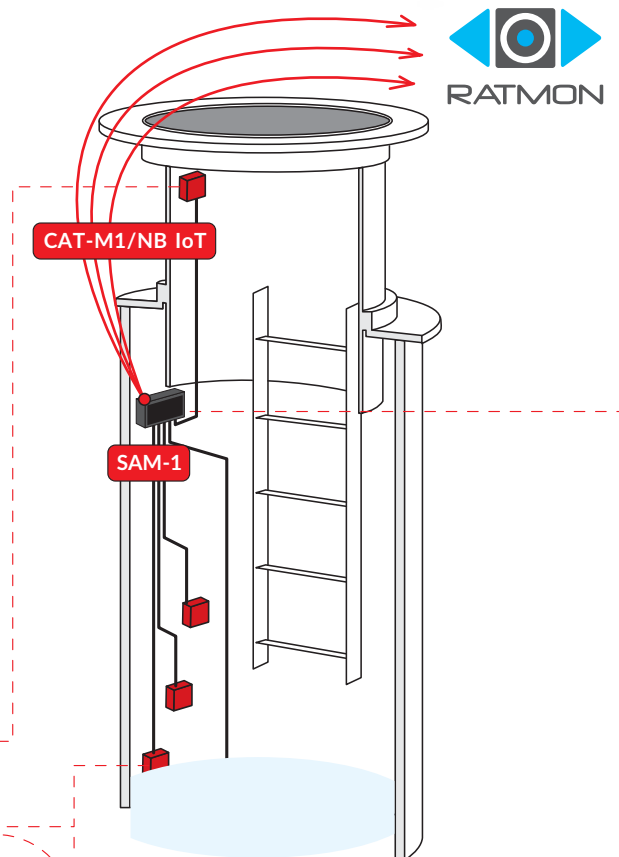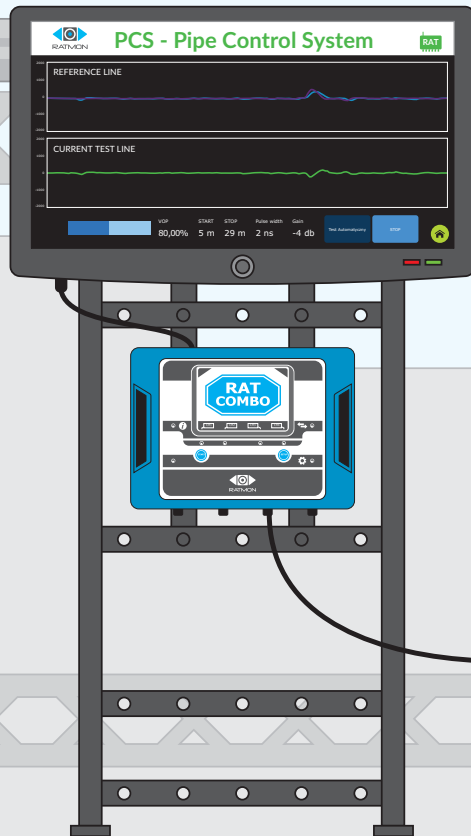
PCS | Pipe Control System

PCS
Production test system for pre-insulated pipes

Quality control of pre-insulated pipes and fittings with TDR technology helps detect:

- incorrect position of the alarm wire
- quality of foam filling
- wire break

Inspection is done in seconds by comparing the image of the object being inspected to a reference curve.

reference reflectogram

differential graphs

16
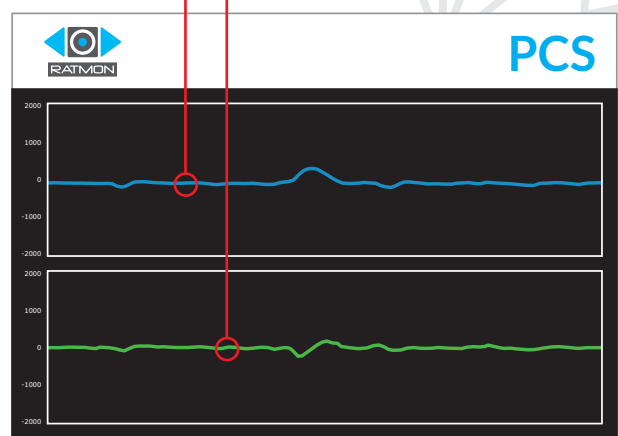
Leak detection system
for internal building installation

WATER PIPE

TECHNICAL
FLOOR

SERVER
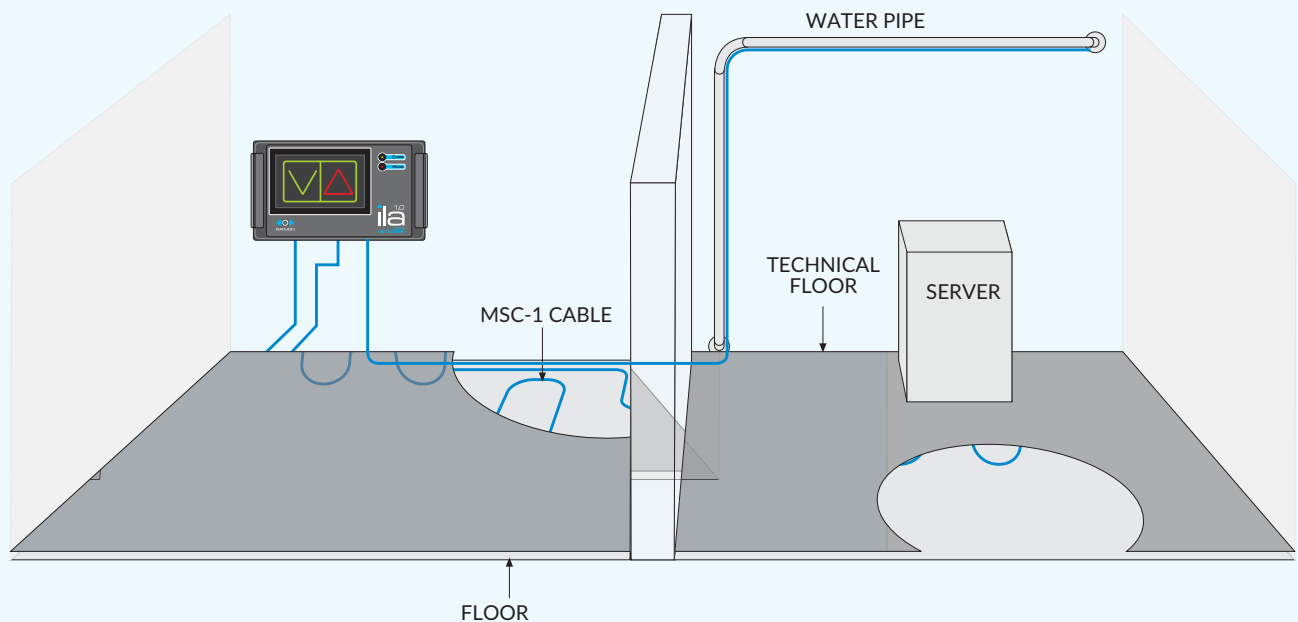
MSC-1 CABLE

FLOOR

LDS consists of:
- ILA-1 alarm unit
- MSC-1 sensor cable that can be installed directly
  under the pipe, on the floor or around the
  sensitive equipment.

MSC-1 sensor cable is installed to the pipe by self-
adhesive tape.

MSC-1 can be integrated with pipes with
or without insulation.

Leak detection and location is based
on TDR technology.
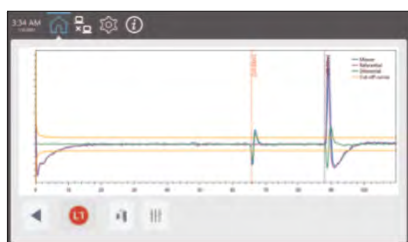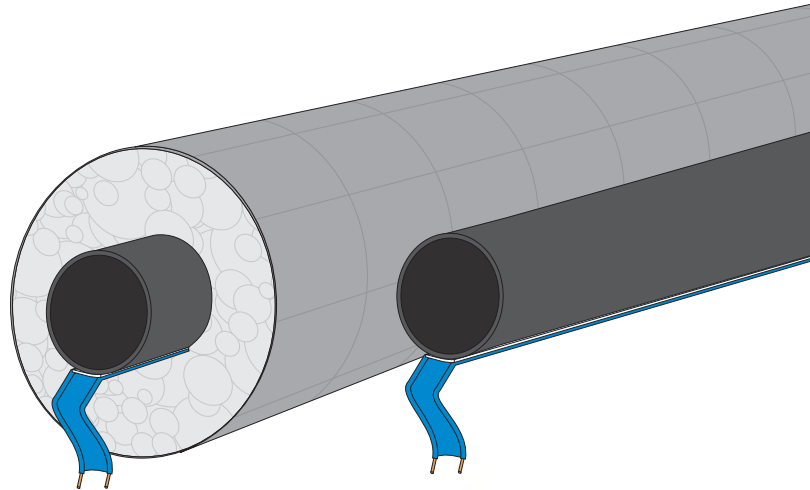
SENSOR CABLE
MSC-1

MSC-1 Sensor cable

Our patented solution of two double-wire MSC-1 cables enables precise detection and location of faults in pre-insulated pipes, used in district cooling and heating. Fully insulated cables, mitigates the risk of false alarms, caused by condensation effect. It is also great solution for monitoring of pre-insulated plastic pipes, straight or PEX type, where using of conventional alarm wires is not efficient.
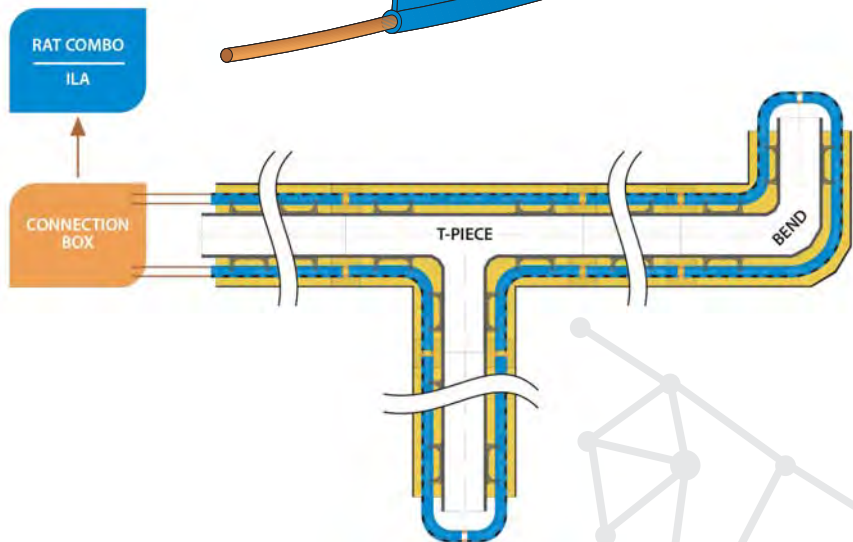
General information:	Fault detection and location
Application:	District heating and cooling Pre-insulated pipes: steel and plastic
Leak location:	Relfectometer (TDR)
Technical data:	
Cable insulation:	Insulation resistant to high temperature and oil
Cable wires:	2 parallel copper wire 2 x 0,98 mm
Dimensions:	8,3 x 2,2 mm
Working temperature:	-40°C to +120°C
Loop resistance:	30 Ω / 1 km of wire
VOP (velocity of propagation):	80% for polyurethane foam

Installation in pipes:

Double wire clip

A = 55,5 mm
B = 35,5 mm
C = 16,5 mm
D = 80,0 mm
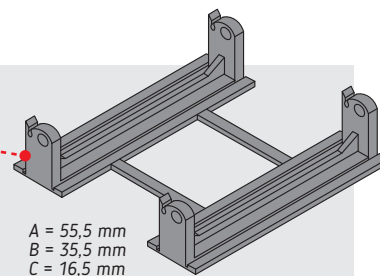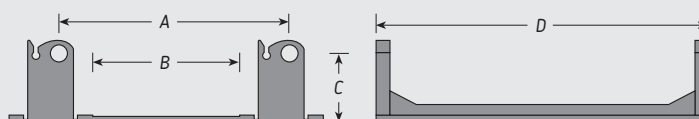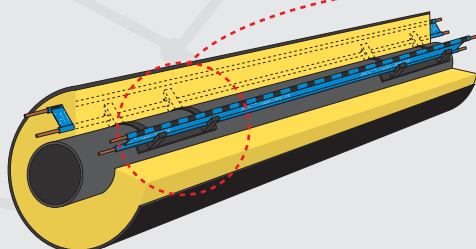
Self-adhesive foam tape
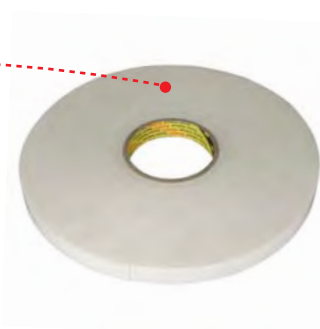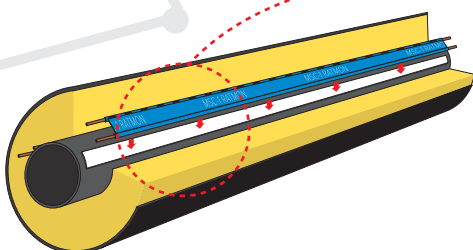
A = 10,0 mm

Connection between pipes
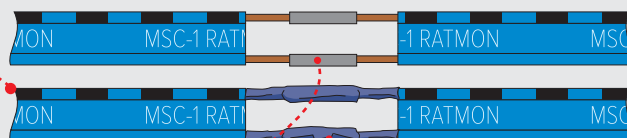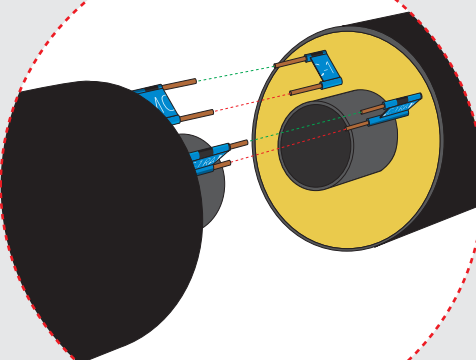
Crimp connector
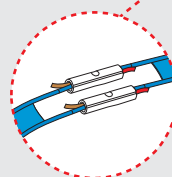
Heat shrink tube
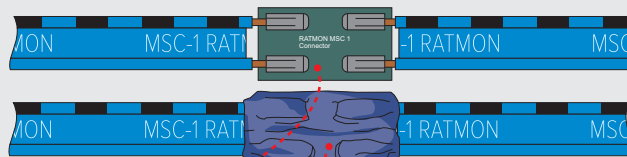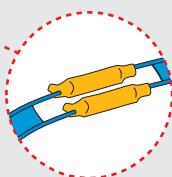
Quick connector set
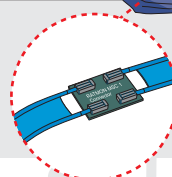
Heat shrink tube
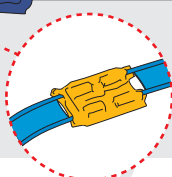
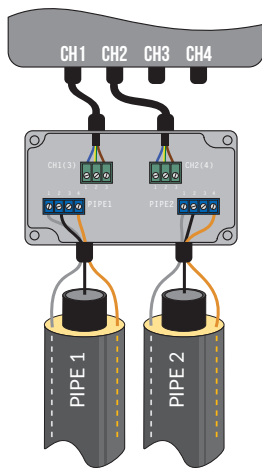## Optional accessories:

DESCRIPTION	PACKAGING	INDEX
Sensor cable	500 m	MSC-1
Cable clip	1500 pcs	CLIP-1
Adhesive tape	60 m	TAPE-1
Crimp connector	100 pcs	CON-1
Quick connector set	100 pcs	CON-2
Heat shrink tube	100 pcs	HST-1

BOX-1
Basic connection box, two loops

PIPE 1

PIPE 2

· Application in impluse and resistance network
· Connection of preinsulated pipes with RAT-2 and RAT-2B detectors
· Two channels (two alarm loops)
· Mechanical installation with mounting brackets
· Connection of cables by terminal block connectors
· Connection of detector by terminal block connectors
· Max wire diameter 7 mm
· Housing IP65
· Dimensions: 150 x 70 x 60 mm
· Weight: 0,2 kg

Compatible with:
RAT-2
RAT-2b

BOX-3
Constant impedance connection box, one loop

CH1 CH2
L1 L2 L1 L2

BNC BNC

PIPE 1
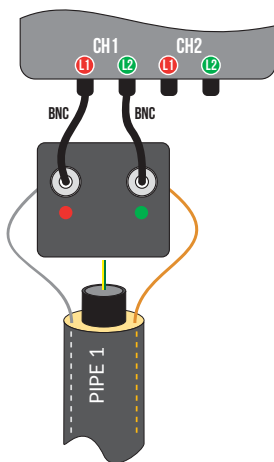
· Application in impluse network
· Stationary connection of RAT-Combo
· One channel (one alarm loop)
· Mechanical installation by pipe
· Connection of detector by BNC cables
· Housing IP65
· Dimensions: 50 x 50 x 50 mm
· Weight: 0,15 kg

Compatible with:
RAT-Combo

BOX-4
Five-core wire connetion box, two loops

CH1 CH2 CH3 CH4

PIPE 1

PIPE 2
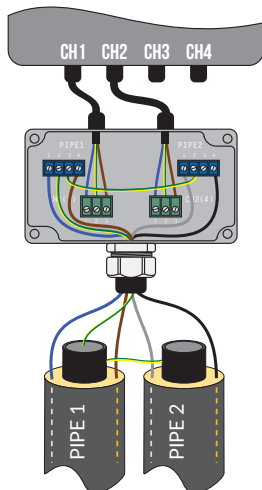
· Application in impulse and resistance network
· Connection of RAT-2 and RAT-2b
· Two channels (two alarm loops)
· Mechanical connection by mounting brackets
· Wires connection by terminal block connectors
· Detectors connection by terminal block connectors
· Max average diameter of wire 16 mm
· Application by 5-wire connection cables
· Housing IP65
· Dimensions: 150 x 70 x 60 mm
· Weight: 0,2 kg

Compatible with:
RAT-2
RAT-2b

BOX-5
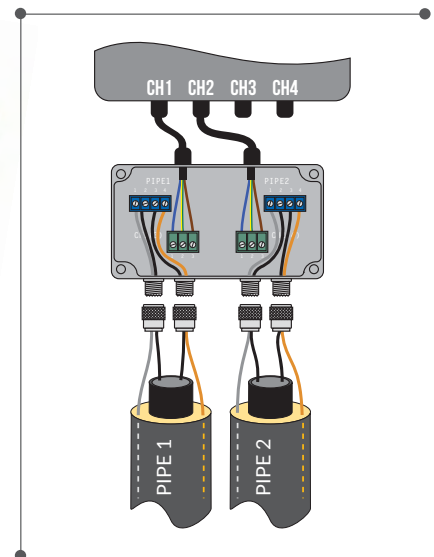### BNC/UHF connection box, two loops

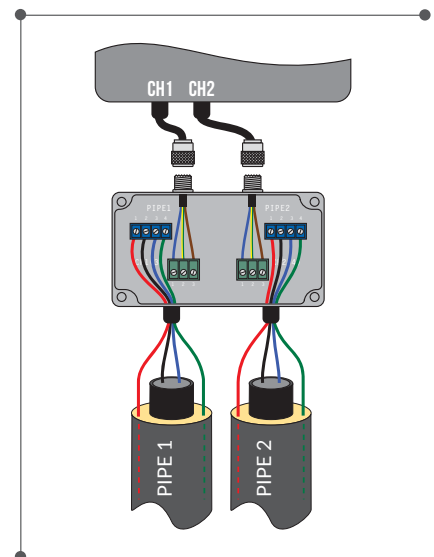**Compatible with:**

RAT-2

· Application in impulse
· Connection of RAT-2 detectors
· Two channels (two alarm loops)
· Mechanical installation by two mounting brackets
· Alarm wires connected by UHF (concentric cables)
· Detectors connection by terminal block connectors
· Housing IP65
· Dimensions: 190 x 130 x 60 mm
· Weight: 0,3 kg
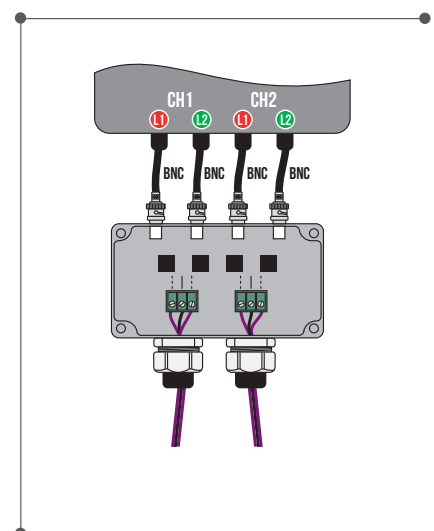
BOX-6
M16 6pin connection box, two loops

Compatible with:

RAT-2b

· Application in resistance network
· Connection of RAT-2b detectors
· Two channels (two alarm loops)
· Mechanical installation by two mounting brackets
· Alarm wires connected by terminal block connectors
· Detectors connection by industrial connectors M16 6PIN
· Housing IP65
· Dimensions: 190 x 130 x 90 mm
· Weight: 0,2 kg

BOX-7
3-wire sensor cable connection box, 2 alarm loops

Compatible with:

RAT-Combo
ILA 1.0

· Application in impulse network
· Connection of RAT-Combo and ILA detectors
· Two channels (two alarm loops)
· Mechanical installation by two mounting brackets
· Alarm wires connection by terminal block connectors
· Detectors conneciton by BNC cables
· Housing IP65
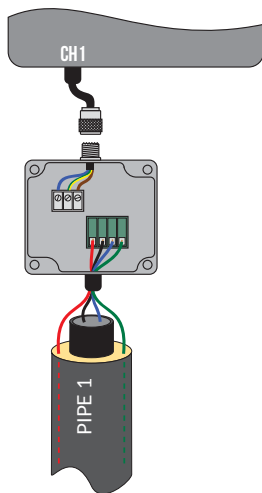· Dimensions: 190 x 130 x 60 mm
· Weight: 0,36 kg

BOX-8
### M16 6pin connection box, one loops

Compatible with:
RAT-2b

· Application in resistance network
· Connection of RAT-2b
· One channel (one alarm loop)
· Mechanical installation by two mounting holes
· Alarm wires connection by terminal block connectors
· Detectors connection by industrial connectors M16 6PIN
· Housing IP65
· Dimensions: 50 x 50 x 50 mm
· Weight: 0,15 kg

BOX-9
MSC-1 connection box, two loops
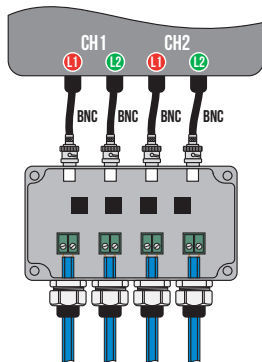
Compatible with:
RAT-Combo
ILA 1.0

· Application in impulse network
· Connection of RAT-Combo and ILA detectors
· Two channels (two alarm loops)
· Mechanical installation by two mounting brackets
· Alarm wires connection by terminal block connectors
· Detectors conneciton by BNC cables
· Housing IP65
· Dimensions: 190 x 130 x 60 mm
· Weight: 0,36 kg

SOL-1
Solar Power Kit

Compatible with:
RAT-2
RAT-2b
RAT-Combo
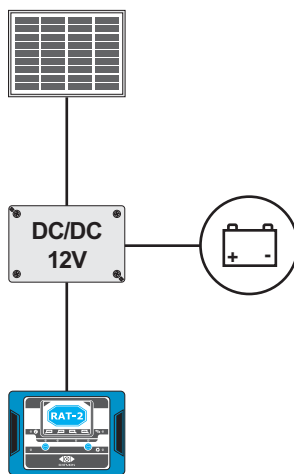
A complete solar kit that allows the installation of equipment for monitoring pre-insulated networks of the RAT series in a remote location, where access to power supply is difficult. The kit was selected so as to ensure stable operation of the equipment even during extended periods of cloudy days.
The complex includes:
· Solar panel
· Charge controller
· Accumulator
· Airtight housing for the acumualator and charge regulator
· Dimensions: 251 x 186 x 107 mm
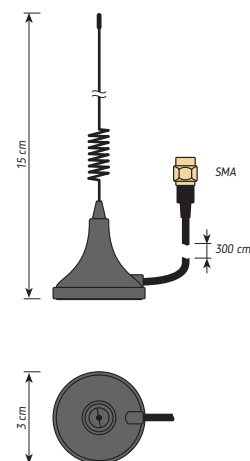· Weight: 1,75 kg

Accessories

Compatible with:

RAT-2
RAT-2b
RAT-Combo
ILA 1.0

· Additional external GSM antenna
· Type: RF
· Antenna energy gain: 3dBi
· Linear polarization
· Impedance 50 Ω
· Frequency 470...862 Mhz
· Magnetic base for easy mounting
· 3 m cable with SMA connection
· Weight: 0,15 kg
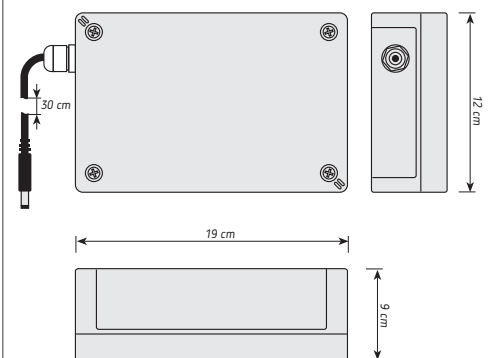
ANT-1
External GSM antenna

SMA

15 cm

300 cm

3 cm

Compatible with:

RAT-2
RAT-2b
RAT-Combo

· Output: 12 V DC
· 8 R20 baterries
· Housing IP65
· Installation by DIN rail
· Dimensions: 19 x 12 x 9 cm
· Weight: 1,55 kg

BAT-1
Battery module

30 cm

12 cm

19 cm

9 cm

Compatible with:

RAT-2
RAT-2b
RAT-Combo
ILA 1.0
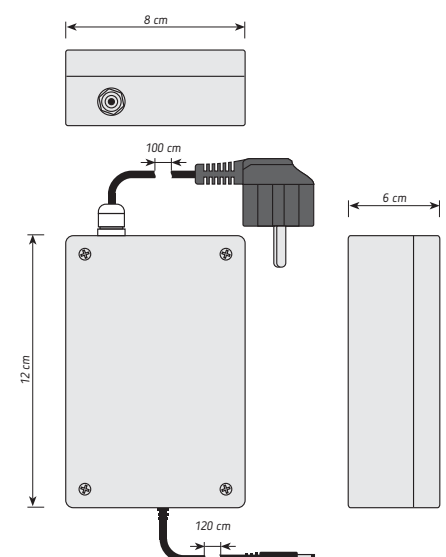
· Protection class: IP65
· Voltage: 230 V / 12 V
· Current: 500 mA
· Dimensions: 12 x 8 x 6 cm
· Weight: 0,42 kg

ZH-1
Hermetic power adapter

8 cm

100 cm

6 cm

12 cm

120 cm

GND-1
Grounding bracket

Compatible with:
steel,
pre-insulated pipes
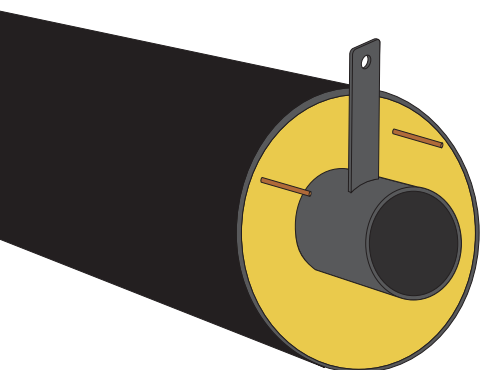
- M8 bolt with nut
- Dimensions: (A) 100 x (B) 30 x (C) 4 mm, (D) 6 mm, (E) 9 mm
- Weight: 0,08 kg
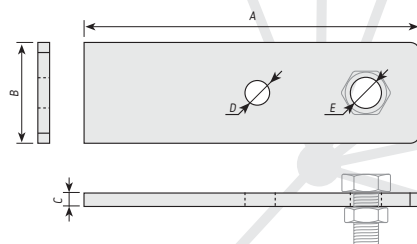
MZM-1
Magnetic pipe connector

Kompatybilne z:
RAT-Combo
MEGALOC-1/1b
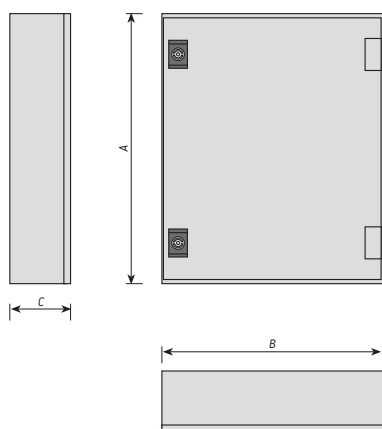SMARTLOC-1

50 mm

50 mm

16,5 mm
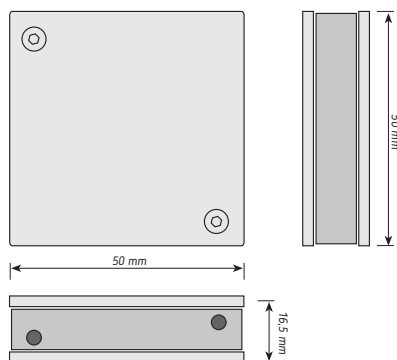
- Reliable, stable connection with the pipe
- Designed to check the quality of the connection to the pipe
- Two independent banana sockets
- Made of high quality stainless steel
- Weight: 0,1 kg

SK-1
External, hermetic cabinet

Compatible with:
RAT-2
RAT-2b
RAT-Combo
ILA 1.0

- Material poliester
- Lock with key
- Mouting plate
- Protection cable
- Protection class 1
- Housing IP66 (NEMA 4X)
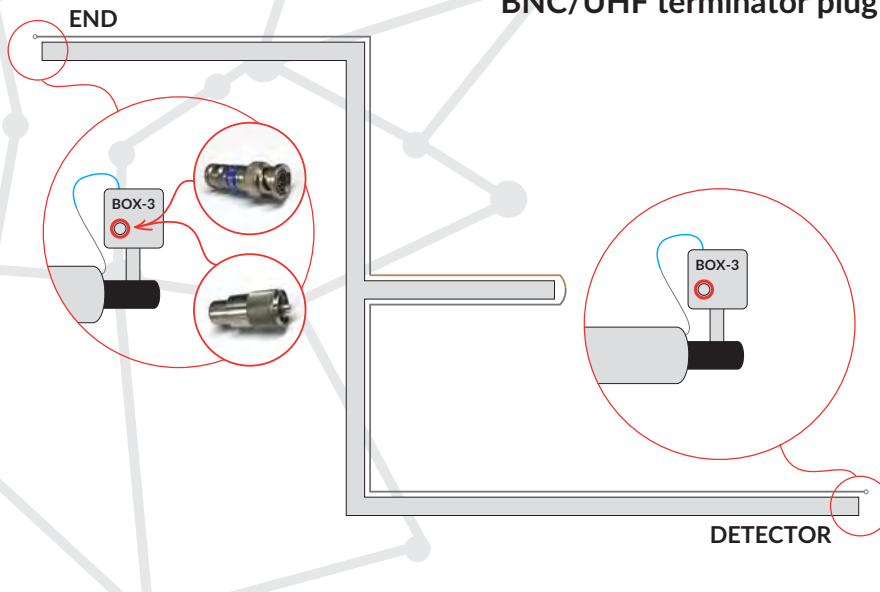- Dimensions: (A) 530 x (B) 430 x (C) 200 mm
- Weight: 5,5 kg

TB-1 · TU-1
BNC/UHF terminator plug for unlooped alarm systems

END

BOX-3

BOX-3

DETECTOR

Exemplary methods of connecting devices with pipes

RAT-Combo

BOX-3

PIPE

BNC/UHF

BOX-3

PIPE

BNC/UHF

RAT
COMBO

RAT-2

BOX-3

PIPE

BOX-3

PIPE

BNC/UHF

BNC/UHF

RAT-2

BOX-5
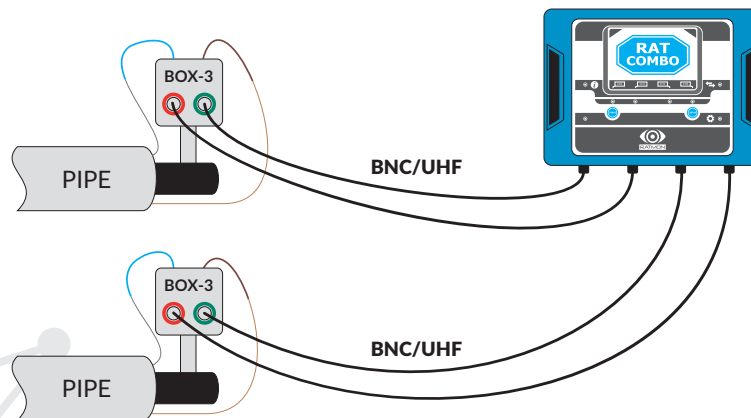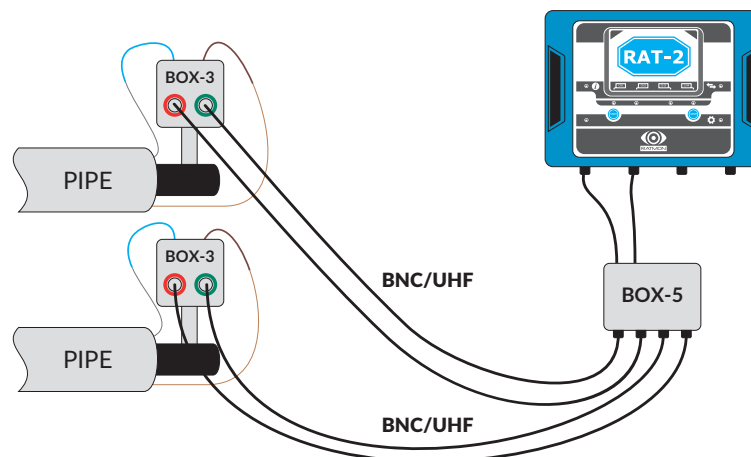
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