INSTALLATION MANUAL AND USER GUIDE
for gas meter Domus*next*® 2.0 MMU6

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1. SAFETY

1.1. Read and store

This installation guide is meant only for qualified personnel and hence does not contain the typical phases for the mechanical installation of a gas meter. The present installation guide must be read entirely before commissioning the meter.

Domus*next*® gas meters are calibrated measuring instruments and therefore must be handled with care.

The present device must be installed and set to work according to the applicable laws.

The instructions are available also on www.metersit.com.

 IMPORTANT: the meter seal is realized for MMU6 by a hot plate welding of the plastic cover to the meter plastic base. Seal shall not be damaged. A damage to the seal or a forced opening of the case invalidate manufacturing warranty and the metrological conformity of the product.

NOTE: meter must be installed according to the requisites of the Voluntary type examination certificate.

Domus*next*® gas smart meters, based on the thermal-mass measuring principle, have been designed for domestic or industrial use to measure consumption of natural gas group H. Different uses may cause measuring errors, gas leakage or damage to the meter.

1.2. Responsibility

MeteRSit is not accountable for damages caused by the non-compliance to the instructions or by inappropriate use.

The manufacturer provides a warranty according to the general purchasing conditions. The manufacturer does not provide warranty and is not accountable in case of inappropriate use or of unauthorized manipulations or of installations not performed as indicated in the present manual.

Functioning is guaranteed only in the indicated operating conditions (please refer to section 7. TECHNICAL DATA). Any other use must be considered as inappropriate.

1.3. Maintenance and care

The external parts of the meter must be cleaned using exclusively a damp cloth in order to avoid static hazards that could increase the risk of explosions. The use of cleansers containing solvents is not allowed.

1.4. Disposal

Domus*next*® smart gas meters are classified among the Electrical and Electronic Equipments (EEE) and present on the marking the symbol to indicate the separated collection for EEE, which consists of the crossed-out wheeled bin.

MeteRSit meters, as WEEE, must be collected separately, since the disposal of WEEE as unsorted municipal waste is strictly forbidden; usually the correct disposal happens through the available collection points that, upon request, can be indicated by MeteRSit.

The disposal of such a WEEE in a not environmentally sound way may cause severe effects on the environment and human health as a result of the presence of harmful and hazardous substances in the electronic boards and in particular in the TLC batteries inside the product. MeteRSit encourage and highlights the decisive role of the purchasers in the correct collection and disposal of smart gas meters.

2. TRANSPORTATION AND STORAGE

Domus*next*® integrated gas smart meters must be protected against dirt and from damages that could occur during storage, transport, or installation. For this reason, the fittings must remain closed with the proper caps, provided with the measuring instruments, until the commissioning of the device. The meter must be transported and store in the original packaging and in vertical position. When the product is received, please check the delivered material (see section 3. COMPONENTS). Damages occurred during transportation must be immediately communicated to: customersupportUK@metersit.com.

Domus*next*® integrated gas smart meters must be stored in vertical position and in a dry place. Meter storage must be according to technical specifications (see section 7. TECHNICAL DATA). If the physical installation on the gas network is not planned and storage can last indefinitely, in order to avoid degradation of internal and replaceable batteries, storage temperature must be maintained between +10°C and +30°C, as requested by most TLC batteries manufacturers.

3. COMPONENTS

3.1. Measuring range and product names

Code	Product name	Measuring range
04850	MMU6 Domus*next*® 2.0	0,04 – 6 m³/h

The following table lists the frequency bands used and the maximum power transmitted for all communication modules assembled in the gas meter:

Radio	Frequency Bands	Maximum TX	
ZigBee	2.405GHz-2.480GHz	+10dBm	
ZigBee	863MHz-876MHz	+14dBm	
ZigBee	915MHz-921MHz	+14dBm	

3.2. Packaging

MeteRSit Serial Number of Domus*next*® gas smart meters, present also on the waybill, is composed:

- by 14 characters as per IGEM/GM/PRS/50 serial numbering nomenclature, with the following layout: E6Tnnnnnnnyyvv, where 'nnnnnnn' is the numbering per year, 'yy' is the year of production and 'vv' indicates the product version

Domus*next*® MMU6 gas smart meters shipped components are:
- n° 1 gas smart meter
- n° 1 replaceable battery TLC size D, normally connected
- n° 1 installation kit composed by:
    - 1 battery cover + 1 seal (both normally closed)
    - 1 installation manual and user guide

4. INSTALLATION

Domus*next*® gas smart meters must be installed according to the installation instructions of the gas supplier and to the applicable safety norms. Applicable installation norms are the national technical guidelines for gas installations.

UKCA Domus*next*® MMU6 meters are certified for the use in potentially explosive atmospheres according to S.I. 2016:1107 and referring to Part 6 of Schedule 3A (Internal production control) with marking ⟨Ex⟩ **II 3G Ex ic IIB T4 Gc**, i.e. they can be installed in zone 2 areas determined by gases included in group IIB and with an auto-ignition temperature above 135°C.

SI 2016:1107 reference standards are: EN IEC 60079-0:2018, EN60079-11:2012. The reference ambient temperature is defined by the following range: from -25°C to +55°C.

Domus*next*® smart gas meters must be installed and de-installed only by qualified and authorized personnel.
Domus*next*® smart gas meters must be installed only in areas compliant to the application, remembering that IP protection is 67 and that it must be provided with gaskets suitable for natural gas. Contact with oils or greases must be avoided both internally and externally.

The plastic cover of Domus*next*® smart gas meter shall not be subject to mechanical stress during installation. Inlet and Outlet fittings shall not be subject to mechanical stress during installation and in the normal use.

4.1. Preliminary operations

Extract Domus*next*® gas smart meter from the box and verify its integrity. Be sure that the plastic cover is not damaged in any part. Take note of the 14 digits Serial Number of the meter, visible on the plastic cover and starting with 'E6T' (see section 3.2).

4.2. Meter installation

Domus*next*® smart meters must be installed with the display in front and horizontal position and the connections to the pipe oriented upwards. Moreover, when the pipes are non-metallic, a minimum distance of 2 cm must be foreseen between the gas meter and the walls of the installation compartment. This distance must also be guaranteed with respect to other meters eventually installed in the same compartment.

Domus*next*® meter is an electronic measuring instrument based on the thermal mass measuring principle. The meter measures gas volume in specific thermodynamic conditions. Standard cubic meter is the quantity of gas that has a volume of 1 cubic meter at the pressure of 1,01325 bar and at the temperature of 15°C. The measure presented on the display is already temperature and pressure converted (refer to t_b and p_b on the meter plate). To visualize meter data on the display, several screens can be scrolled to show the available information (see section 5.1).

⚠️ **ATTENTION:** before starting with the installation, the gas line must be checked and cleaned from possible dregs (for instance dirt, eroded metals, welding dregs, liquids).

4.3. Tightness test and direct purging

Safety suggests that, both in case of a new installation or of an existing installation, tightness test and direct purging must be executed as per IGEM procedure IGE/UP/1B Edition 2.
The pressure created during purging shall not exceed the Maximum Operating Pressure of the meter.

Manufacturer refuses any responsibility in case of installation procedures performed not in conformity with the explanations provided in the present instructions and which may compromise the correct functioning of the instrument. In that case, there is a loss of meter's warranty.

4.4. Battery

Domus*next*® gas smart meters must be equipped only with the TLC size D battery, 3.6 Volt DC standard version, supplied together with the meter.

⚠️ **ATTENTION:** Use only battery models "Lithium Thionyl Chloride - bobbin type - 3,6V – 19Ah - Size D" supplied by MeteRSit S.r.l. because these models have been tested to guarantee the safety features required by the standard EN60079-11. The use of battery not qualified by MeteRSit or with different format generate a loss of warranty on the product and compliance with the UKEX standards.

For any question regarding the correct handling of batteries please contact Customer Care service. A wrong handling of batteries may cause fire or explosions.

Dispose batteries according to national applicable laws.

Do not damage in any way the batteries.

Do not eliminate batteries in waste incinerators.

Do not store batteries close to heat sources.

Do not connect batteries directly to an electric source.

Do not short-circuit poles.

Do not recharge batteries.

Do not touch with bare hands batteries that are showing leakages.

4.4.1 Battery cover removal

In case of need to replace the battery (signaled by a remote alarm or by the relevant icon on the display) a properly instructed engineer shall be provided with: a Torx T20 screwdriver, a new battery and a new seal with company logo covering the screw. All spare parts must be qualified and supplied by MeteRSit. Use of components different from the ones supplied by MeteRSit can create severe damages to the meter and the loss of warranty.

A not metrological seal is included in the battery cover. To remove the battery cover, proceed as follows:
1. Pierce the seal covering the screw (e.g. with a screwdriver) and break it.
2. Remove the old seal and unscrew counterclockwise.
3. Lift the battery cover and remove it taking care not to damage the gasket of the battery cover.

4.4.2 Battery cover closure

The correct closure of the battery cover is crucial to guarantee the Ingress Protection degree of the meter (IP67).

To properly close the battery cover have care to connect the anchoring hooks, screw and put the new seal on the screw.

4.4.3 Battery replacement

In case of need to replace the battery, the next steps must be followed. Please note that in case the display shows the string 'BATTERY DEPLETED', it is recommended to wait at least 1 minute between steps 2 and 3 below:

1. Remove the battery cover as detailed in section 4.4.1.
2. Carefully extract the battery from the compartment and disconnect it.
3. Connect the new battery. The battery pack connector is polarized in such a way as to fit only in the gas meter connector observing the correct polarity.
4. Insert the new battery in the compartment taking care that the cable is positioned to not create any interference in the cover closure.
5. Once the battery pack has been replaced, pay attention to hermetically close the battery compartment with the special cover, the supplied screw, and the company seal, as detailed in section 4.4.2

5. USER INTERFACE

Domus*next*® smart gas meters display activates after pushing one of the two buttons and is deactivated automatically after 60s of inactivity. In this document the right button will be referred to as the R button and the left button as the L button.

5.1. Display sequence through R button

The following Upper-level screen sequence is available when scrolling using R button short press:

Upper level

Not joined	or other potentials screens*
Volume Vb	total volume in cubic metres
Balance	meter balance
Pay as you Go**	for prepayment menu
Billing	for billing information
Information	for information relevant for the User
Privacy	for Privacy PIN handling
HAN Status	Home Area Network status
Tech Menu	for Technical information
Date Time	for meter clock information
Metrology	legally relevant SW identifier
Application	application SW identifier
Bootloader	bootloader SW identifier
All dots/no dots	dots verification screens

*appearing under specific conditions, e.g. Emergency Credit, Supply State Disabled and so on...
** screen available only in case of prepayment mode.

The meaning of the display icons is as follows:

⋈ Enabled supply

⋈ Armed supply

⋈ Disabled supply

⚠ alarm icon in case of an important alarm, e.g. a valve error

ND supply not disabled because of Non-disconnect Period

(ᵗᵖ) antenna icon identifies an ongoing HAN communication

🔋 battery icon when the battery level is below 10

⊠ battery depleted

🔒 lock icon in case of a legally relevant information

≫ indicates an action to be performed

⬇ child screen available

⬆ parent screen available

⬅ moving leftwards is possible in UTRN entry screen

5.2. Meter Commissioning

5.2.1 Activate communication

To connect the meter to the Home Area Network, it is necessary to activate the communication of the meter. To force the first communication, hold for 2s the R button from the flash screen 'Not joined' or 'Unjoined from HAN' or from 'HAN Status' screen when the same strings are visible. The screen will show the proper icon to indicate an attempt to establish HAN communication.

⚠ **ATTENTION:** if the communication is not activated, the meter will never try to join the HAN. On the other hand, if it has been activated, the Auto Pairing mechanism starts and the meter tries to join. It tries for 2 minutes. After 2 minutes without success the meter goes into sleep and sets the next awakening after 13 minutes. This wakeup / sleep sequence repeats for 1 hour; if after 1 hour the meter is unable to join, the wakeup / sleep burst is suspended and will restart after 23 hours and 20'.

5.3. User Privacy PIN

Privacy PIN is used to protect User information on some meter screens. If Privacy PIN is not set, all user information is visible on display otherwise, to make them visible, Privacy PIN shall be entered.
If the correct Privacy PIN has been entered, the PIN locked screens remain visible for 120 seconds.
If a wrong PIN is entered, it is possible to repeat the procedure for four additional attempts. At the fifth failure, the procedure to Enter, (Change or Disable) the PIN is suspended for 30 minutes, and on the 'Enter Pin' screen the message 'Suspended' is shown.

5.3.1 How to set the privacy PIN

It is only possible to enter only a 4 digits PIN, as follows:

1. To activate privacy PIN, hold for 2s the R button from the 'Privacy' screen. The following screens are available to configure the PIN: 'Set Pin', 'Enter new Pin', 'Confirm Pin'
2. If a Privacy PIN has been already configured, upon holding the R button from the 'Privacy' screen, the following screen sequence is available when scrolling using R button short press: 'Enter Pin', 'Change Pin', 'Disable Pin'

5.3.2 How to insert digits via the User Interface

The following rules apply:

a) R button Short Press: is used to set value of the selected digit of input value. Selected digit blinks with a rate of 1 second. Each press of push button increments digit value from 0 up to 9, after 9 is reached digit value restarts from zero.
b) L button Short Press: is used to select digit to set, each press on this button confirm value on current selected digit and move on the next one initializing it to 0. If the selected digit is the last one of input data, it restarts from the first digit.
c) Hold R button: is used to confirm input data. Hold L button: is used either to move leftwards (opposite action to point b), when entering UTRN or PIN, or to abort input procedure

5.3.3 How to Change or Disable the privacy PIN

When Privacy PIN is set, 'Change Pin' screen is visible.
Follow the next steps to change the Privacy PIN:

1. Hold R button to enable PIN insertion when 'Change Pin' screen is visible. The new screen 'Enter old Pin' will be shown
2. Enter the old PIN number. If it is correct 'Good' will be shown. Press R to access the screen 'Enter new Pin'
3. Enter a new PIN number
4. Confirm the new PIN number

5. If the two entered PINs match, a 'Good' string is shown, to confirm the correct execution of operation, Privacy PIN has been changed.

When Privacy PIN is set, 'Disable Pin' screen is visible.

Follow the next steps to disable privacy PIN protection.

1. Hold R button to enable PIN insertion when 'Disable Pin' screen is visible. The new screen 'Enter Pin' will be shown.
2. Enter the correct PIN number
3. If the entered PIN is correct, a 'Good' string is shown, to confirm the correct execution of the operation. Privacy PIN is disabled, and all User information is now visible.

5.4. Valve operations

5.4.1 Before enabling the supply

MeteRSit MMU6 meters provide a safety test following the re-opening of the shut-off valve.

The test following the opening has the purpose to detect any Uncontrolled Gas Flow Rate (UGFR) immediately after the supply has been enabled again. Therefore, before acting on the User Interface to enable the Supply, it is necessary to verify that all the gas appliances downstream of the meter (e.g. gas boilers, gas fires, hobs and so on) have been switched-off. If this is not the case, the UGFR test will shut-off the valve immediately and the procedure described in the next section will have to be repeated.

5.4.2 Enabling the supply

To Enable the Supply, hold for 2s the R push button when 'Are your appliances off?' screen is visible. Some placeholders '-' moving rightwards will indicate the movement of the valve. As soon as the Supply is enabled again, the 'Supply State' screen will show 'Enabled'.

5.4.3 Valve test

To test the shut-off valve incorporated in the meter, hold for 2s the R button when 'Test Valve' screen is visible and during a physical access through the Secure Perimeter. Valve test is executed as follows:

- where the Supply State is Enabled, Disable the Supply for one minute and then Arm the Supply
- where the Supply State is Armed, Enable the Supply for one minute and then Arm the Supply,
- where the Supply State is Disabled, Enable the Supply for one minute and then Disable the Supply.

If, during the test execution, an external condition (e.g. credit goes below disablement threshold) triggers a change in the supply status, the test is stopped.

The string to be shown during test execution, e.g. from the Supply State Enabled are as follows: 'In Progress', 'Closing', 'Disabled', 'Arming', 'Armed'.

5.5. Add Credit

1. Hold for 2s the R button when 'Top Up' screen is visible
2. Enter UTRN data, as described in section 5.3.2.
3. If UTRN entered data match, the bottom row will show 'Accepted' and the Balance' screen will be shown with the updated value and after 6 seconds the proper flash screen will be shown:

a. 'Are your appliances off? Hold R for gas' in case topping up allowed to move the meter balance above the Disablement threshold
b. 'Disabled supply Top up at least' in case topping up did not allow to move the meter balance above the Disablement threshold and a further top up is needed

6. SPECIAL INSTALLATIONS

If the meter is installed in locations not related to gas distributions and is compared with rotary meters, the following general considerations apply.

Any test system that includes the use of a rotary meter must be assembled so that vibrations generated by the rotary meters are adequately absorbed. This precaution must be observed also in case there is the need to put a rotary meter downstream or upstream of a Domus*next*® smart gas meter. For example, a volume of 0.3 m^3 between the two meters is enough to absorb any perturbative effect.

For any information and/or clarification please contact the manufacturer at the following email address: info@metersit.com.

7. TECHNICAL DATA

Description	MMU6
Destined for measurement of	Natural gas group H
Accuracy class	1,5
Measuring range	0,04 – 6 m³/h
Conversion	Volume at base conditions only
Environment classes	M1 / E2
Gas temperature range	-25°C - +55°C
Ambient temperature range	-25°C - +55°C
Designed for	Condensing humidity
Intended location	Open
Maximum Operating Pressure	500 mbar
Display	Dot-matrix
Communication type	ZigBee Smart Energy 1.4
Monthly profile consumption	13 months
Weekly profile consumption	5 weeks
Daily profile consumption	8 days
Half hourly profile consumption storage	13 months
Storage Temperature*	-25°C - +60°C
Ingress Protection and impact	IP 67, IK 08
Dimensions (L x H x D)	230,5 x 163 x 101 mm
Nominal diameter	1" BS 746
Weight	2,2 kg

*NOTE: Storage temperature should be as suggested in section 2.TRANSPORTATION AND STORAGE to minimize batteries self-discharge.