

Compact heating meter

AT 7505

| Dimension range | PN | Temperature range | Material |
|-----------------|-------|-------------------|---------------------------------|
| DN 15-250 | 16/25 | -20°C to + 130°C | Brass/Cast iron/Stainless steel |

Range of application

For measuring thermal energy in heating and cooling systems with water or anti-freezing additive (e.g. glycole, tycofor) as heat or cold carrier. The complete meter consists of a static flow meter based on oscillary meter and piezo electric element, electronic integrator with LCD display and temperature sensor pairs PT 500, factory mounted M-bus and two pockets.

Program text

UGA.50 *Meter with compact function

Compact heating/cooling meter AT 7505...complete with static flow meter (based on oscillary measuring principle and pieze electric element) integrator with LCD display and temperature sensor PT500, integrated M-Bus and pockets. q_p m^3/h , DN in performance.

AMR module for connection to M-Bus master/Gateway.



AT 7505

Quality assurance

AT 7505 is certified according to SS-EN1434 MID class 2, and performance according to SWEDAC 2006:4- Certified by registered body LEI, certification number LT-1621-MI004-PTB013.

CE-marking

According to MID 2014/32/EU

Material specification

| | Components | Material |
|---|---------------------------------|---|
| 1 | Meter body | Brass (DN 15-40) Cast iron (DN 50-150), Stainless steel (DN 200-250), available from DN 50 (not standard) |
| | - Connection (thread/flange) | Thread DN 20-40, Flange DN 20-250 |
| 2 | Membrane to ultra sound element | Stainless steel 1.4435 |
| 4 | Integrator protection | ABS & Polycarbonate |
| 5 | Temperature sensor | |
| | - Protection sleeve | Stainless steel 1.4435 |
| | - Connection cable | Silicone |

Dimensions and weight

| Threaded connection, permanent flow q_p 1,5 to 10 | | | | |
|---|--------|-------|----------|-------|
| Permanent flow q_p (m^3/h) | 1,5 | 2,5 | 6 | 10 |
| Connection after gauge coupling | DN 15 | DN 20 | DN 25 | DN 40 |
| Meter's thread* | G 3/4" | G 1" | G 1 1/4" | G 2" |
| Build length | 110 | 190 | 260 | 300 |
| Weight | 1,8 | 2,3 | 2,9 | 6,1 |

Measurements in mm, weight in kg *) The gauge's thread is one size larger than connection after gauge coupling

Flanged connection, permanent flow qp2,5-10

| | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|--------|
| Permanent flow q_p (m ³ /h) | 2,5 | 6 | 10 | 15 | 25 | 40 | 60 |
| Flanged connection | DN 20 | DN 25 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
| Length (mm) | 190 | 260 | 300 | 270 | 300 | 300 | 360 |
| Weight | 3,0 | 4,6 | 6,8 | | | | |

Measurements in mm, weight in kg

Function and design

AT 7505 is a static compact meter for thermal energy measuring in heating and cooling application with water or anti-icing mixtures as fluid. The meter consists of a static flow meter of oscillary type and piezo element, paired PT 500 temperature sensors and a separate electronic integrator with multifunction LCD display for display of accumulated energy and volume, factory fitted M-Bus and pockets. There is also a possibility to read instantaneous values for flow, effect, temperature for inlet, return and temperature difference, max and minium values, and self test with error indication.

AT7505 has a static flow meter therefore, without movable parts. This means that it is free from parts that can be worn out and, since it doesn't have any magnetic parts, is not sensitive of water with a high magnetite content. The flow meter is using the oscillary principle to measure the velocity of the fluid and piezo element sensors to detect the pressure difference. The frequency of the oscillation is proportional to the the fluid's velocity.

The flow value is integrated with the temperature loss over the pipe and the so called s k K-factor, which is calculated and presented as energy amount on the display.

The meters are delivered as a standard with mains power supply but battery supply is available as an option on request. The meter should always be installed in the colder pipe line, in other words the return pipe line in heating systems and the input pipe line on coolings systems, with the **meter head angled 45 degrees**.

The meter can be retro fitted with AMR modules type M-bus (slot 2), MODbus, LON or analogue 4-20 mA

Flow meter

| Flow meter | 1 | | | | | | | | | | 125 | 150 | 200 | 250 |
|--------------------------------------|-------------------|---|---|---|---|---|---|---|---|---|-----|-----|-----|-----|
| | D | 1 | 2 | 2 | 4 | 5 | 6 | 8 | 0 | 0 | | | | |
| Nominal flow, q_p | m ³ /h | 1 | 2 | 5 | 6 | 1 | 1 | 2 | 4 | 6 | 100 | 150 | 250 | 400 |
| Max flow, q_s | m ³ /h | 3 | 5 | 2 | 2 | 3 | 5 | 8 | 2 | 1 | 200 | 300 | 500 | 800 |
| Minimum flow, q_i | m ³ /h | 1 | 2 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 3 | 5 | 8 |
| Pressure loss by q_p | bar | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 100 | 100 | 100 | 100 |
| Dynamic measuring area (q_p/q_i) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 50 | 50 | 50 |
| Nominell PN | | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 16 | 16 | 16 | 16 |

Technical data

Pressure and temperature

| | |
|---|--|
| Pressure | max 16 bar, max 25 bar flanged version |
| Temperature range | -20°C to + 130°C |
| Measuring cycles (specified in seconds) | |
| Temperature | |
| Mains power supply 230V | 3 sec |
| Battery | 30 sec |

Measuring characteristics

Measuring characteristics

| | |
|--|---|
| Normal flow q_p - minimum flow q_i | 100:1 (Q_p 1,5 - Q_p 25) 50:1 (Q_p 40- Q_p 400) |
| Max flow q_s - normal flow q_p | 2:1 (all models) |
| Temperature range media | - 20 - +130 °C |
| Accuracy | Class 2 according to EN 1434-1 (all models) |

Integrator

| Integrator | |
|---|---|
| Temperature range, T | -20- +200 °C |
| Temperature difference range, ΔT | 3-150 K |
| Electromagnetic environment class | Class E 1 |
| Mechanical environment class | Class M 1 |
| Surrounding temperature | 5-55 °C |
| Storage temperature | -25 - 70 °C |
| Protection class | IP 65 (only flow sensor IP 68) |
| Display | LC-display with 8 figure display with alternative symbols |
| Measure unit of consumed energy | kWh / MWh |
| Temperature sensor | PT 500, dual wire connection |
| Energy consumption | 230 VAC as an option 3,6 vDC lithium battery. |
| Communication ports for remote reading | 2 st (Integrated M-Bus (1 slot) and Pulse (2 slot) |
| Data ports | - Optic |
| Length of cable between integrator and flow gauge | 3 m |
| Measurements (BxHxD) | 138x110x46,3 mm |

Temperature sensor

| Temperature sensor, paired | |
|--|--|
| Resistance elements | Platina Pt 500 according to DIN EN 60751 |
| Temperature range | 0- +150 °C |
| Insert length/diameter, standard | |
| Qp 1 - 2,5 m ³ /h (DN 15 - DN 20) | 34 mm/6 mm, 2 m cable length |
| Qp 3,5 - 15 m ³ /h (DN 25 - DN 50) | 84 mm/6 mm, 2m cable length |
| Qp 25 - 150 m ³ /h (DN 65 - DN 150) | 134 mm/6 mm, 2m cable length |
| | 174 mm/6 mm, 2m cable length |
| Qp 200 - 400 m ³ /h (DN 200 - DN 250) | |
| Thread on pocket | G 1/2 |
| PTB approval | K 7.2 |

Consumption register

The consumption register is shown on a 8 figure LCD where the values for energy, effect, volume, volume flow, temperature inlet and return, delta T and eventual error code is displayed.

Necessary configuration settings and changes are possible with the optical interface or through M-bus.

Display menus

The energy meter has a LCD-display with 8 figures for main values and 7 different menus. Through a simple button press on the key (straight arrow) you will be looped between different measure values within a menu group. To change between the 6 different sub menus hold the key (straight arrow button) down for 3-4 seconds.

The six different menus that are shown are specified below:

1: Main menu

- Accumulated consumption (energy volume)
- Instantaneous values (effekt, flow, temperature, delta T)

2: Reading menu

3: Monthly values

4: Average values

5: Peak values

6: Configuration menu

7. Service menu

Sizing

Sizing the meter with flow between q_p and q_s . Do not oversize, if there are more than one possible size, pick the smaller one, control that the pressure loss isn't too big (max 250 mbar). This meter type can not be worn out through overload, since it lacks movable parts.

Communication ports

For remote reading and connection to DUC/Master, there are several plugin modules. The integrator is provided with two slots for remote reading modules, which gives you a high degree of flexibility when it comes to remote reading.

The following modules can easily be installed without damaging the verification seal:

Factory-fitted communication outputs

Pulse outputs (blocks 16,17 & 18)

Type open collector, Energy (blocks 16 & 17) och volume (blocks 18 & 17).

M-bus (block 24 & 25)

The meter can be addressed either by its primary or secondary address which are displayed in the LCD. The secondary address is also shown on a sticker above the PCB inside the integrator. 1 load unit (1,5 mA).

Retro-fitted communication modules

LONWORKS® module, AT 7275SON-L

Integration to the meter by FTT-10A (Free Topology Transceiver)

MODBUS module, AT 7275SON-MOD

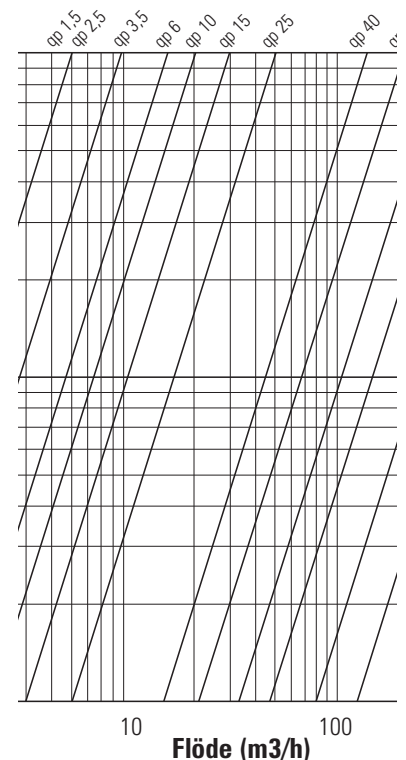
MODBUS-RTU

ANALOGUE MODULE, AT 7275SON-AN

4-20 mA

M-BUS module (2nd) AT 7275SON-M

Only if a second M-Bus communication module is needed, M-Bus according to EN 13757-3



Specifications pulse module, AT 7275POL-P and AT 7275POL-PB

Specifications pulse output

| | |
|---------------|--|
| Pulse length | Roughly 100 ms (max pulse frequency 5 Hz) |
| Max voltage | 30 V |
| Max power | 40 mA |
| Output Energy | Connection block 16 & 17, 10 l/puls = 1 kWh, 100 l/puls = 10 kWh |
| Output Volume | Connection block 18 & 17 |

Accessories and options

| Accessories | Order number |
|--|--|
| Couplings (2 per meter) for G 3/4 (is also a part of the installation kit below) - G 2 | AT 7056A15 x2 pc, 7056A20-2 /25-2 / 40-2 |
| Gauge block | |
| - 1pc. 110 mm | AT 7590P15-110 |
| - 1pc 190 mm | AT 7590P20-190 |
| -1 pc 260 mm | AT 7590P25-260 |
| - 1 pc 300 mm | AT 7590P40-300 |
| Transition piece to obtain 130 mm G 1 build length from 110 mm G 3/4 | AT 7055R20-25 |

Accessories and options

| Remote reading modules | |
|---|-----------------|
| M-Bus module (2nd module) for remote reading according to EN 13757-3 | AT 7275SON-M |
| MODBUS module for MODBUS RTU | AT 7275SON-MOD |
| Analog signal for communication through analog signal 4-20 mA | AT 7275SON-AN |
| LONWORKS® module | AT 7275SON-L |
| Power module 230V with two outputs for MODBUS and LON modules | AT 7505NAT2 |
| Spare parts | |
| Temperature sensor paired Pt 500, cable length 2 m. Length 45 mm | AT 7276-45PT500 |
| Batteri 3,6 volt battery for battery powered unit | AT 7505-BAT |

Accessories and options

| Options | |
|---------------------------------|--------------|
| Compact meter | |
| - in flanged performance *) | AT 7505... |
| - in threaded performance *) | AT 7505-G... |
| *) See the section how to order | |

Installation

During the meter installation it should be taken in to account that the measuring is done correctly metrologically, and that the meter is installed in such a way that

maintenance and meter reading can be performed easily. The flow meter should be mounted in the pipe line that has the lower temperature, i.e. for heating systems in the return pipe and in cooling systems in the inlet pipe. If the meter is installed in the wrong pipe line the measured values are not reliable and the MID-approval is no longer valid. Re-configuration of installation can be performed by Armatec service.

The flow meter can be mounted both horizontally and vertically. The meter is recommended to be installed horizontally with the meter pipe tilted 45° to the side. A straight line before or after the meter isn't necessary, but a calm undisturbed straight line of 3xDN before the meter is recommended to obtain a good and stable flow profile. The flow meter should be placed on a low point to prevent the effect of air in the system. The placement of the flow meter should also not be directly after a valve or before a pump. It is recommended to install a shut down valve before and after the meter to facilitate a possible replacement of the meter.

Note! Meters with threaded connection is only intended for flat seal with required water meter couplings and fiber gaskets, e.g. AT 7056. Threaded joint with, as an example, flax or corresponding seal can not be used.

Media temperature over 90°C and constantly high ambient temperature (over 55°C) the electronic parts (integrator) should be mounted in an environment with room temperature. The standard meter has a 3 m cable between integrator and flow sensor. This cable can not be cut or spliced since the integrator and flow sensor are calibrated and certified as one unit. If the cable is cut the compact meter will not work and will need to be replaced by a new compact meter. The integrator is prepared for wall mounting.

Connection of temperature sensors with dual wire connection.

The sensors are marked with blue and red color marking respectively for mounting in cold and hot flow line respectively. The sensor's/thermal well's tip should be placed in the middle of the flow.

Marking

Manufacturing, type designation "Superstatic & Supercal, manufacturing number, manufacturing year, flow data, flow direction, temperature range, class IP, CE marked.

How to order compact meter

Threaded performance, 230V, installation in colder pipe line, fluid*

| AT-no | qp | Length (mm) | DN | Comment |
|--------------|-----|-------------|----|---------|
| 7505-G15-1,5 | 1,5 | 110 | 15 | |
| 7505-G20-2,5 | 2,5 | 190 | 20 | |
| 7505-G25-6 | 6 | 260 | 25 | |
| 7505-G40-10 | 10 | 300 | 40 | |

* if another fluid than water is used, concentration and type of fluid must be specified when ordering

How to order compact meter - options

| Flanged, main power supply 230V, installation in colder pipe line, fluid* | | | |
|---|-----|-----|--------|
| AT-no | Qp | DN | Length |
| AT 7505-25-6 | 6 | 25 | 260 |
| AT 7505-40-10 | 10 | 40 | 300 |
| AT 7505-50-15 | 15 | 50 | 270 |
| AT 7505-65-25 | 25 | 65 | 300 |
| AT 7505-80-40 | 40 | 80 | 300 |
| AT 7505-100-60 | 60 | 100 | 360 |
| AT 7505-125-100 | 100 | 125 | 250 |
| AT 7505-150-150 | 150 | 150 | 300 |
| AT 7505-200-250S | 250 | 200 | 350 |
| AT 7505-250-400S | 400 | 250 | 450 |

* if another fluid then water is used, concentration and type of fluid must be specified when ordering

How to order remote reading modules

| AT-no | Description |
|-------------|--------------------------|
| 7275SON-M | M-Bus module |
| 7275SON-L | LONWORKS® module |
| 7275SON-MOD | MODBUS module |
| 7275SON-AN | Analogue module (4-20mA) |