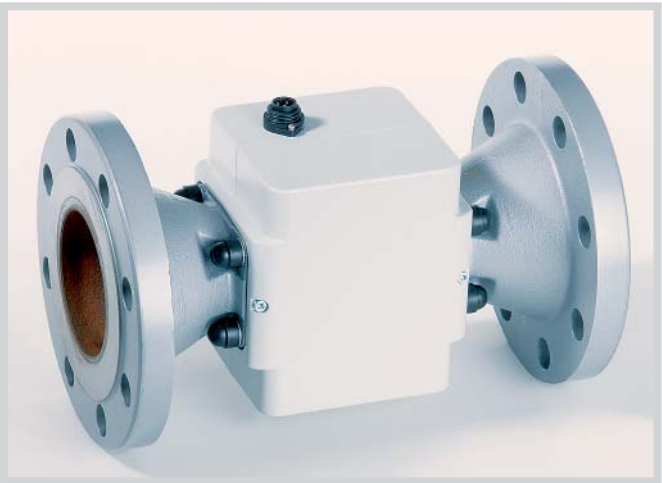
APPLICATION

- ❑ Volume measuring component based on magnetic inductive measuring principle operates without wearing partsand is therefore especially reliable and durable
- ❑ Accurate measurement of small and large amounts of heat using state-of-the-art electronic measuring techniques



FEATURES

- ❑ All functions are controlled by the electronic integrator – from the power supply, measuring circuits and calculations to the informative displays
- ❑ Easy-to-operate user interface
- ❑ Adaptable to the user's needs via individual programming facility with Windows-based software
- ❑ Integrated M-Bus interface as standard
- ❑ 11 different sizes available for flow rates between 0.015 m³/h and 180 m³/h
- ❑ High precision over a long period of time through the combination of magnetic inductive measurement and state-of-the-art electronics
- ❑ Broad spectrum of applications assured by a variety of hardware and software modules
- ❑ Very large measuring range and low head loss
- ❑ High degree of data security even if power fails
- ❑ User-friendly installation and control
- ❑ Network analyses using max./min. memory
- ❑ Individual billing via tarif meter

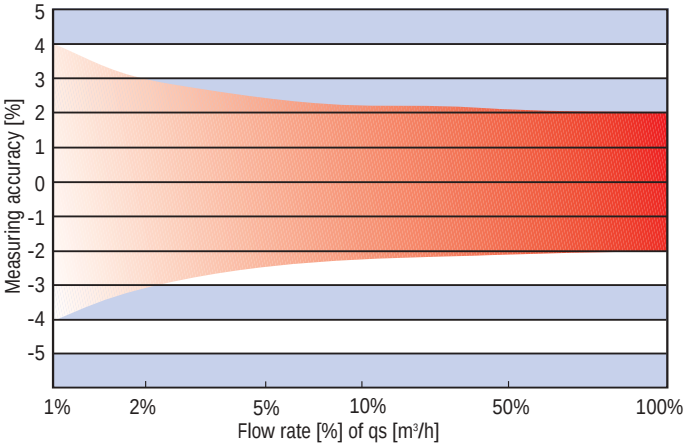


COMPONENTS OF SCYLAR-HEAT

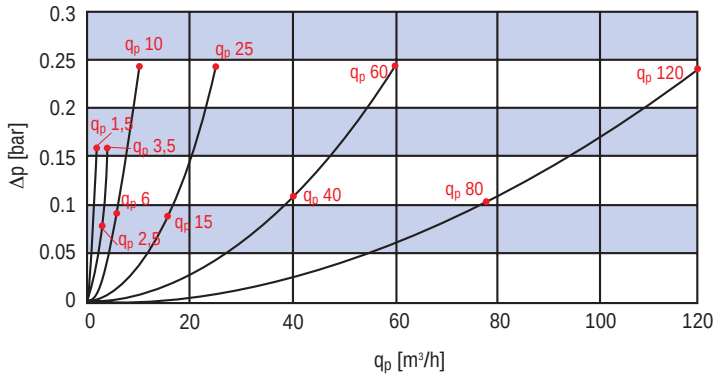
- ❑ Volume measuring component
- ❑ Integrator
- ❑ Temperature sensors

MEASURING ACCURACY

Measuring accuracy to EN 1434 class 2



HEAD LOSS GRAPHS FOR SCYLAR TYPE 1.5 - 120 m³/h



INTEGRATOR

The integrator contains state-of-the-art circuits for coil excitation in the volume measuring component, measurement of flow rates and temperature, integration, calculation, logging and data display. The attractive new design with its low height ensures easy installation of the meter. The meter is conveniently read via an illuminated two-line LC display. Two pushbuttons provide user-friendly control of the various display loops.

All measurement inputs can be used as either terminal or plug-in connections. The integrator is connected to the supply voltage (230 VAC/24 VAC). The reading is still available if the power fails, as all information is saved in a non-volatile memory (EEPROM).

This prevents loss of data. A long-life battery safeguards the operation of the real-time clock in the event of power failures. The duration of the power failure is recorded in the EEPROM.

TEMPERATURE SENSORS

The SCYLAR temperature sensors (Pt 100) are supplied with pockets and cables for connecting them to the integrator.

VOLUME MEASURING COMPONENT

The volume measuring component is based on the magnetic inductive measuring principle. It has a rectangular measuring cross-section with electrodes over the full height, which helps to achieve a large measuring range independent of the flow profile. It is designed for the maximum flow rate of the system and can be supplied for installation in either the forward or return line. The high measuring accuracy is maintained without the need to install calming sections in the inlet and outlet. The flow conditions in the volume measuring component have been optimized over the previous model and the component meets the requirements of EN 1434.

METER SIZES

- ❑ 11 different sizes available, i.e. with 11 different volume measuring components with flow rates between 0.015 m^3/h and 180 m^3/h.
- ❑ Volume measuring components are dimensioned as shown in each case, where qs is the maximum permissible continuous flow rate. All meters can register up to q_p + 50 %.

ACCESSORIES

❑ EXTENSION MODULES

The SCYLAR has two slots for extension modules for connecting to external devices.

Analogue module

Equipped as standard with two electrically isolated 4-20 mA outputs. These two outputs can be programmed independently of each other, e.g. for flow rate, power, forward temperature, return temperature or temperature difference.

Digital I/O module

The digital I/O module has two contact inputs with a common earth connection and two electrically isolated passive outputs.

RS-232 module

- ❑ Serial interface for communication with external devices e.g. a PC

Integrated M-Bus interface

❑ SOFTWARE

The SCYLAR software tools are based on the M-BUS and offer convenient facilities for handling the heat meter.

They run on Windows®95 or later and are used for:

- ❑ reading out the measured values
- ❑ taking the meter into operation and for analyses
- ❑ implementing customer-specific changes

SCYLAR-Set

- ❑ Central service software tool for the user
- ❑ Menu-controlled, easily operated Windows 95 program for individual customer use, e.g. configuration of heat meters and volume meters

SCYLAR-LOG

- ❑ Reads the data logs of the heat meter, archives them, visualizes the measured values and prints diagrams and tables.

SCYLAR-TEST

- ❑ Used for professionally taking the meter into operation and for analyses

DATA LOGGING

Two types of log are active:

- ❏ four data logs for consumption values
- ❏ an event log for faults and user changes

The values from the various logs can be read out on a PC.

DATA LOGS

These are arranged into two parts:

- ❏ The short-term log contains the following average values:
  - ■ flow rate
  - ■ heating power*
  - ■ forward temperature*
  - ■ return temperature*

  All these values contain a time stamp.
- ❏ The long-term log contains the following meter values:
  - ■ energy consumption*
  - ■ volume of water
  - ■ operating hours run
  - ■ forward energy*
  - ■ tariff meter (energy and volume)*

  These meter values are stamped with date, year and day of the week.

The short-term log is normally used for faultfinding and optimization. The long-term log is used for consumption analyses, where the values can be used for calculations, e.g. average return temperature.

Log frequency	Data recorded	Log period
Every 6th minute	Flow rate	2 days
Hourly	Heating power Forward temperature Return temperature	14 days
Every 24 hours	Volume meter	1 year
1st and 15th of each month	Operating hours, tariff meter, Forward energy (forward temperature x volume)	7 years

All data logs are stored parallel in SCYLAR-HEAT.

* This information applies to the heat meter only.

EVENT LOG

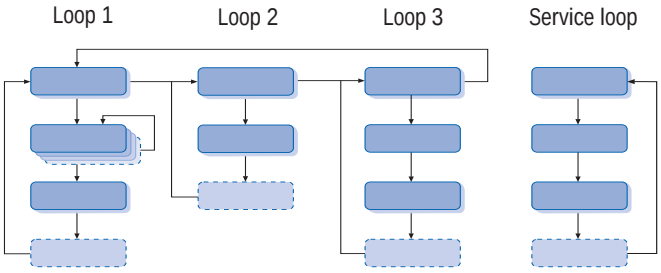
The last 30 faults or changes (e.g. clock settings) are recorded continuously with a time stamp and enable the following events to be defined:

- ❏ power failure and restoration
- ❏ temperature sensor error
- ❏ internal communication
- ❏ checksum error
- ❏ clock setting

DISPLAY CONTROL

The SCYLAR display has three user loops and a service loop. Each user loop can contain up to 24 individual windows.

LOOP DEFAULT SETTINGS



The first loop is the main loop and in the default setting contains the current data for flow rate, energy and time/date.

The second and third loop can be used as required for all other functions, e.g. MIN, MAX, tariffs, etc. All three user loops can be programmed individually using the SCYLAR-Set software.

Some information for a certain function is divided between two windows. In this case, the display changes automatically between these two windows every four seconds. There are also windows placed in “succession”. This is the case if windows have the same function, but display different values, e.g. 13 MAX or MIN memory intervals. These can be selected in succession with the control buttons. The unit returns to the main window automatically after 6 minutes if the user makes no input.

The fourth loop is the “service” loop. This loop contains windows available for the service technician for information or configuration purposes. The windows in this loop cannot be changed.

SIMPLE CONTROL

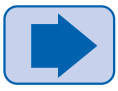
The displays are controlled via two control buttons with arrows on the front panel of the meter, one of which points to the right and one downwards.

The button pointing downwards is used for:



- changing to the next window in the active loop
- switching to the next loop
- changing to the service loop.

The button pointing to the right is used for:



- switching to the next window of successive windows
- configuring within the service loop
- switching to the next loop
- changing to the service loop.

SCYLAR-VOL (VOLUME METER) INFORMATIVE DISPLAYS

The display shows a whole range of informative data.

No.	First display	Description
3	XX 1234.567 m³ 1.23 m³/h	Main VOLUME meter Current flow rate
10	XX > # # 0.97 m³/h YYMMDD hhmm/hhmm	MAX flow rate [# # = index 1-13] Date and time interval
13	XX > # # 0.00 m³/h YYMMDD hhmm/hhmm	MIN flow rate [# # = index 1-13] + temp. 1 and 2 Date and time interval
30	XX [S] hh: mm YYYY-MM-DD W	Current time: summer time, hours, minutes, year, month, date and day of week (Monday = 1)
46	XX YYMMDD 1.2345.67 m³	Main VOLUME meter reading Last 1st and 15th of the month
51	XX T# hhmm/hhmm ww 1.2345.67 m³	Tariff meter # [1-13] (Example of day / night tariff)
100	XX 1234.567 m³ 1234.567 h	Volume meter Hours meter (2 decimal points)
102	XX 1234.567 m³ 12345 h	Volume meter Hours meter (no decimal points)
103	XX 12345.67 h	Hours meter (2 decimal points)
104	XX 1.23 m³/h	Current flow rate
105	XX 12345 h	Hours meter (no decimal points)
114	XX 1234.567 m³ YYMMDD / YYMMDD	Total volume consumption last year
115	XX 1234.567 m³ YYMMDD / YYMMDD	Volume consumption last year until today
116	XX 1234.567 m³ YYMMDD / YYMMDD	Volume consumption this year until today

SCYLAR-HEAT (HEAT METER)

INFORMATIVE DISPLAYS

The display shows a whole range of informative data.

No.	First display	Second display	Description
1	XX 1234.567 MWh 40.0 ° 123.4 kW		Main ENERGY meter Current temp. difference and power
2	XX 12345.67 h t1 = 80 ° t2 = 40 °		Operating hours meter (2 decimal places) Current temp. 1 and 2 (forward & return)
3	XX 1234.567 m³ 1.23 m³/h		Main VOLUME meter Current flow rate
4	XX 1.23 m³/h 40.0 ° 123.4 kW		Current flow rate Current temp. difference and power
5	XX 12345 h t1 = 80 ° t2 = 40 °		Operating hours meter (no decimal places) Current temp. 1 and 2 (forward & return)
6	XX 1234.567 MWh 1.2345.67 m³		Main ENERGY meter Main VOLUME meter

7	XX > # # 0.00 kW
	YYMMDD hhmm/hhmm
		XX > # # t1 = 80 °
		t2 = 40 °
			MAX power [# # = index 1-13] + temp. 1 and 2
			Date and time interval

8	XX I1 = 1234567 I2 = 1234567		Pulse meter 1 Pulse meter 2

10	XX > # # 0.97 m³/h
	YYMMDD hhmm/hhmm
		XX > # # t1 = 80 °
		t2 = 40 °
			MAX flow rate [# # = index 1-13] + temp. 1 and 2
			Date and time interval

13	XX > # # 0.00 m³/h
	YYMMDD hhmm/hhmm
		XX < # # t1 = 80 °
		t2 = 40 °
			MIN flow rate [# # = index 1-13] + temp. 1 and 2
			Date and time interval

16	XX YYDDMM 1234.567 MWh	XX YYDDMM 1234.567 m³	Main ENERGY and VOLUME meter readings for last 1st and 15th of the month
18	XX 27.808 MWh YYMMDD / YYMMDD	XX 681.94 m³ f = 79.3 ° t = 33.5 °	Total consumption last year with average forward temperature and temperature difference
19	XX 17.756 MWh YYMMDD / YYMMDD	XX 402.84 m³ f = 81.5 ° t = 34.1 °	Consumption last year until reading date with average forward temperature and temp. difference
20	XX 15.284 MWh YYMMDD / YYMMDD	XX 389.04 m³ f = 84.3 ° t = 34.1 °	Consumption this year until reading date with average forward temperature and temp. difference
21	XX T# hhmm/hhmm ww 1234.567 MWh	XX T# hhmm/hhmm ww 1234.567 m³	Tariff meter # [1-13] (Example of day / night tariff)
22	XX RD: YYMMDD 52346 MWh	XX RD: YYMMDD 23511 m³	Volume and energy meter reading on reading date
24	XX 1234567 E		E forward meter (forward temperature) counts: (volume pulses)* T_f / 100
30	XX [S] hh: mm YYYY-MM-DD W		Current time: summer time, hours, minutes, year, month, date and day of week (Monday = 1)

The ex works default setting shows the following windows:

- ❑ in loop 1
  windows 6, 2, 4, 30
- ❑ in loop 2
  windows 20, 16, 18, 19
- ❑ in loop 3
  windows 7, 10, 13

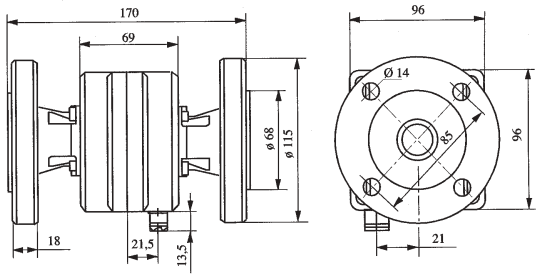
The first three loops can be programmed to suit individual requirements using the SCYLAR-Set software.

TECHNICAL DATA/VOLUME MEASURING COMPONENT

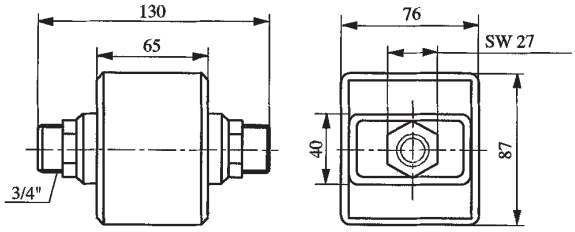
Volume measuring component				1.5	2.5	3.5	6	10	15	25	40	60	80	120
Protection class				IP 54										
Flow rate ranges	Maximum	q_s	m³/h	2.25	3.75	5.25	9	15	22.5	37.5	60	90	120	180
	Nominal	q_p	m³/h	1.5	2.5	3.5	6	10	15	25	40	60	80	120
	Minimum	q_i	m³/h	0.015	0.025	0.036	0.06	0.1	0.15	0.25	0.4	0.6	0.8	1.2
	Starting		m³/h	0.0015	0.0025	0.0036	0.006	0.010	0.015	0.025	0.04	0.06	0.08	0.12
Head loss	At q_p	Δp	bar	0.16	0.09	0.16	0.10	0.25	0.10	0.25	0.11	0.25	0.11	0.25
Operating pressure	Maximum	PN	bar	16	16/25	16/25	16/25	16/25	25	25	25	25	25	25
Coupling threads	Nom. diameter	DN	"/mm	3/4	1	1	1	1						
	Overall length		mm	130	130	130	130	130						
Flange threads	Nom. diameter	DN	"/mm	-	25	25	25	25	40/50	40/50	50/65	50/65	80	80
								40/50	65/80	65/80	80/100	80/100	100	100
	Overall length		mm	-	170	170	170	170	300/270	300/270	270/300	270/360	300	300
								300/270	300/300	300/300	300/360	300/360	360	360
	Material			Brass	Brass/grey cast iron				Grey cast iron					
Medium	Working range		°C	20-90	20-130									
Conductivity		Min.	µs/cm	20										
Installation	Position			Arbitrary										
Weight	incl. 3 m cable		kg	1.3	1.8 / 4.2				13.8	13.8	14.4	16.5	19.2	19.2
Cable length	integrator to volume measuring component			3 m or 10 m										

VOLUME MEASURING COMPONENTS

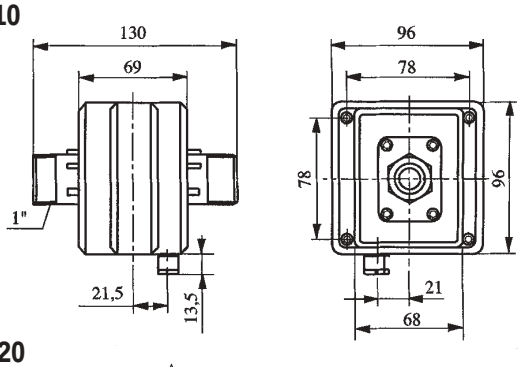
q_p 2,5-10



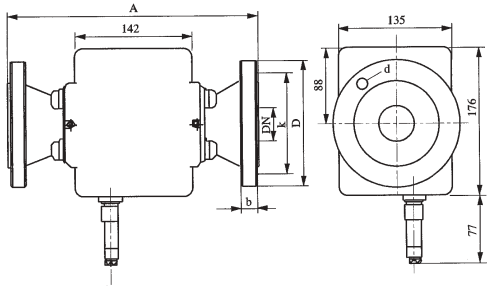
q_p 1,5



q_p 2,5-10



q_p 10-120



DIMENSIONS

Volume measuring component type (qp)		10	15/25	40/60	80/120	
DN	mm	40	50	65	80	100
A	mm	300	270	300	300	360
D	mm	150	165	185	200	235
k	mm	110	125	145	160	190
b	mm	20	22	24	16	28
d	mm	18	18	18	18	23
d	Number	4	4	8	8	8

TECHNICAL DATA/HEAT METER

Heat meter				1.5	2.5	3.5	6	10	15	25	40	60	80	120
Display indication	Total energy			9 999 999-999 999.9-99 999.99-9 999.999										
	Energy unit			kWh - MWh - GJ - Gcal - MBTU										
	Total volume		m^3	9 999 999-999 999.9-99 999.99-9 999.999										
	Current values			Power - flow rate - temperature										
Temperature input	Temperature sensor	Type		Pt 100 / 4-wire or 2-wire										
	Sensor current		mA	Peak = 2, rms = 0.07										
	Measuring cycle	per	s	2										
	Maximum temperature difference	$\Delta\Theta_{max}$	K	±110										
	Minimum temperature difference	$\Delta\Theta_{min}$	K	±3										
	Starting temperature difference	$\Delta\Theta$	K	±0.5										
	Absolute temperature meas. range	Θ	°C	1...160										
Power range	Max. power at q_s	P_s	MW	0.2	0.33	0.47	0.80	1.33	2.0	3.3	5.3	8.0	10.7	16.0
	Max. power at q_p	P_p	MW	0.19	0.32	0.45	0.77	1.28	1.9	3.2	5.1	7.7	10.2	15.4
	Min. power at q_i	P_i	kW	0.06	0.09	0.13	0.21	0.35	0.52	0.9	1.4	2.1	2.8	4.2
Supply voltage	Operating voltage	U_n	V_{AC}	230 (24) + 10 % - 15 %, 50 Hz										
	Power consumption		W	3										
Miscellaneous	Dimensions	HxWxD	mm	195 x 150 x 65										
	Weight		kg	0.9										
	Protection class			IP 54										

ORDER REFERENCES

Extract from the full range (EN 1434 / class 2 calibrated)

The SCYLAR range includes heat meters and volume meters in nominal sizes of q_p 1.5 m^3/h to q_p 120 m^3/h in a wide range of threads and flange sizes to EN 1434. The supply voltage is 230 VAC (alternatively 24 VAC).

The temperature sensors are available in various lengths (50 mm to 120 mm) to match the pipe diameter.

Type q_p	Overall length	Connection	Cable length of temperature sensors	Unit	Article number
1.5	130 mm	G 3/4 B	3 m, 45 / 50 mm	1 kWh / 0.01 m^3	76200001-08601-31051-813000
2.5	130 mm	G 1 B	3 m, 45 / 50 mm	1 kWh / 0.01 m^3	76200009-08606-31051-813000
2.5	170 mm	DN 25	3 m, 45 / 50 mm	1 kWh / 0.01 m^3	76200013-08606-31051-813000
3.5	130 mm	G 1 B	3 m, 45 / 50 mm	1 kWh / 0.01 m^3	76200025-08611-31051-813000
3.5	170 mm	DN 25	3 m, 45 / 50 mm	1 kWh / 0.01 m^3	76200029-08611-31051-813000
6.0	130 mm	G 1 B	3 m, 45 / 85 mm	1 kWh / 0.01 m^3	76200042-08616-31051-813000
6.0	170 mm	DN 25	3 m, 45 / 85 mm	1 kWh / 0.01 m^3	76200046-08616-31051-813000
10	300 mm	DN 40	3 m, 45 / 85 mm	0.001 MWh / 0.01 m^3	76200065-08621-31052-813000
10	270 mm	DN 50	3 m, 45 / 85 mm	0.001 MWh / 0.01 m^3	76200069-08621-31052-813000
15	270 mm	DN 50	3 m, 45 / 85 mm	0.001 MWh / 0.01 m^3	76200093-08626-31052-813000
15	300 mm	DN 65	3 m, 45 / 85 mm	0.001 MWh / 0.01 m^3	76200097-08626-31052-813000
25	300 mm	DN 65	3 m, 85 mm	0.01 MWh / 0.1 m^3	76200130-08631-31054-813000
25	300 mm	DN 80	3 m, 85 mm	0.01 MWh / 0.1 m^3	76200134-08631-31054-813000
40	300 mm	DN 65	3 m, 85 mm	0.01 MWh / 0.1 m^3	76200156-08636-31054-813000
40	300 mm	DN 80	3 m, 85 mm	0.01 MWh / 0.1 m^3	76200159-08636-31054-813000
60	300 mm	DN 80	3 m, 120 mm	0.01 MWh / 0.1 m^3	76200184-08641-31054-813000
60	360 mm	DN 100	3 m, 120 mm	0.01 MWh / 0.1 m^3	76200187-08641-31054-813000
80	360 mm	DN 100	3 m, 120 mm	0.1 MWh / 0.1 m^3	76200205-08646-31055-813000
120	360 mm	DN 100	3 m, 120 mm	0.1 MWh / 0.1 m^3	76200217-08651-31055-813000

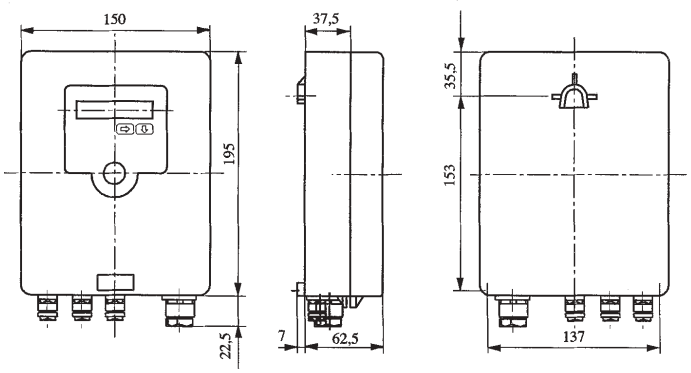
For easy selection of your individual heat meter or hot water meter, ask for our convenient free “Select” software.

3076220

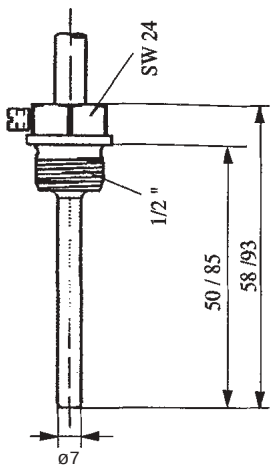
TECHNICAL DATA/INTEGRATOR

Integrator				
Basic features	Ambient class			Class C (+5 °C to +55 °C, installation in industrial plant)
	Protection class			IP 54
	Total energy			9 999 999-999 999.9-99 999.99-9 999.999
	Current values			Power - flow rate - temperature
Display indication	Unit			kWh - MWh - GJ - Gcal - MBTU
	Total volume		m^3	9 999 999-999 999.9-99 999.99-9 999.999
Current values				Power - flow rate - temperature
Temperature input	Temperature sensor	Type		Pt 100 / 4-wire or 2-wire
	Sensor current		mA	Peak = 2, rms = 0.07
	Measuring cycle	Period	s	2
	Maximum temperature difference	$\Delta\Theta_{max}$	K	±110
	Minimum temperature difference	$\Delta\Theta_{min}$	K	±3
	Starting temperature difference	$\Delta\Theta$	K	±0.5
	Absolute temperature meas. range	Θ	°C	1...160
Volume pulse input (contact or open collector)	Pulse values		l/pulse	0.1 - 1 - 10 - 25 - 100 - 250
	Frequency	Max.	Hz	50
	Pulse width		ms	10 - 150
	Input voltage (open)		V	4.5...5.5
	Input voltage (closed)	Max.	V	1.4
	Input impedance	Min.	kΩ	820
Supply voltage	Operating voltage	UN	V_{AC}	230 (24) + 10 % - 15 %, 50 Hz
	Energy consumption		W	3
Miscellaneous	Dimensions	H x W x D mm		195 x 150 x 65
	Weight		kg	0.9

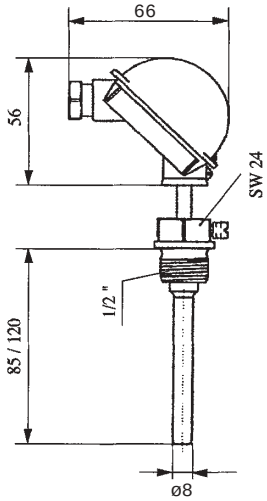
INTEGRATOR



SENSORS WITH POCKETS



Cable sensor



Head sensor