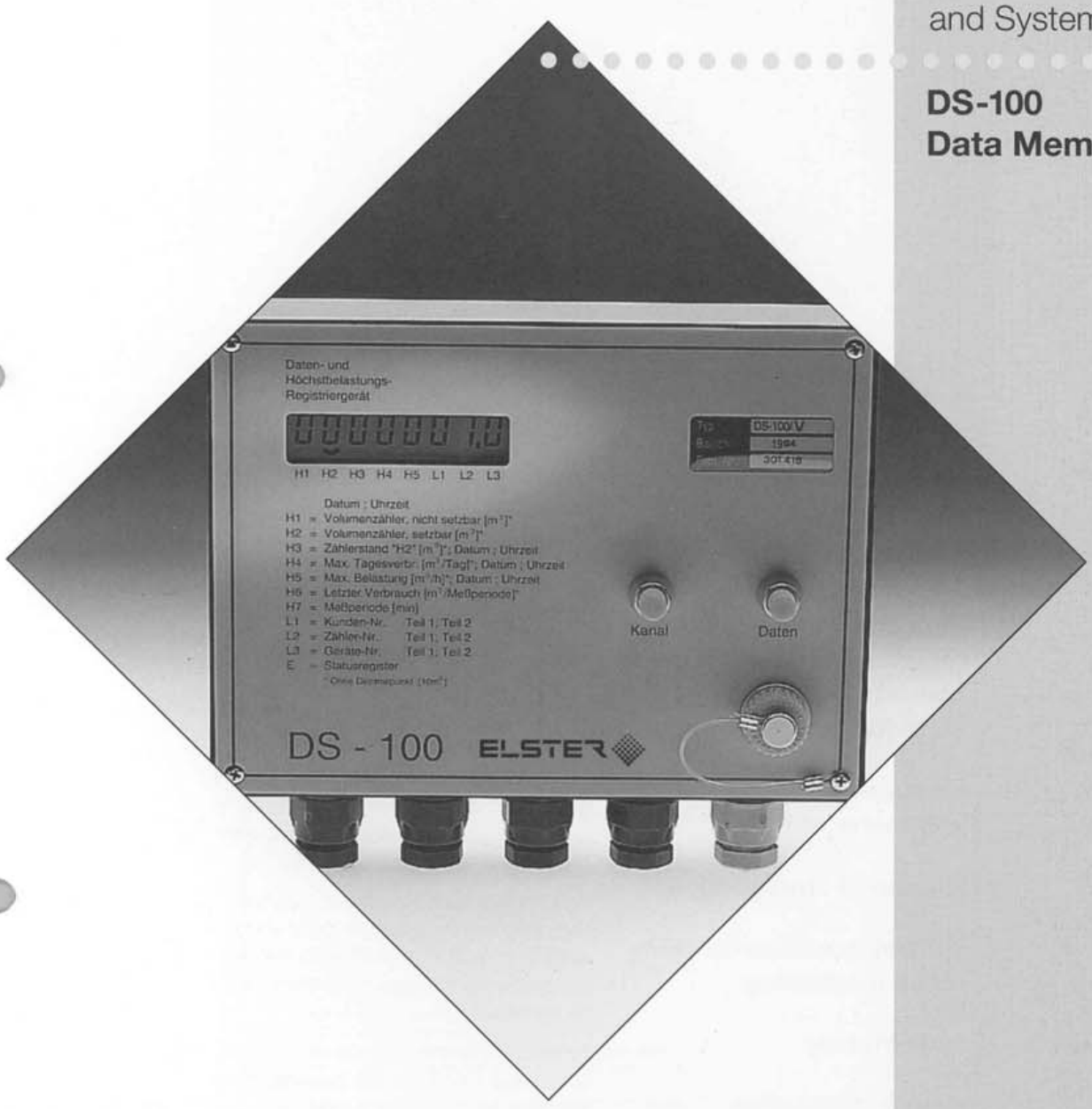
ELSTER

Electronic Devices
and Systems

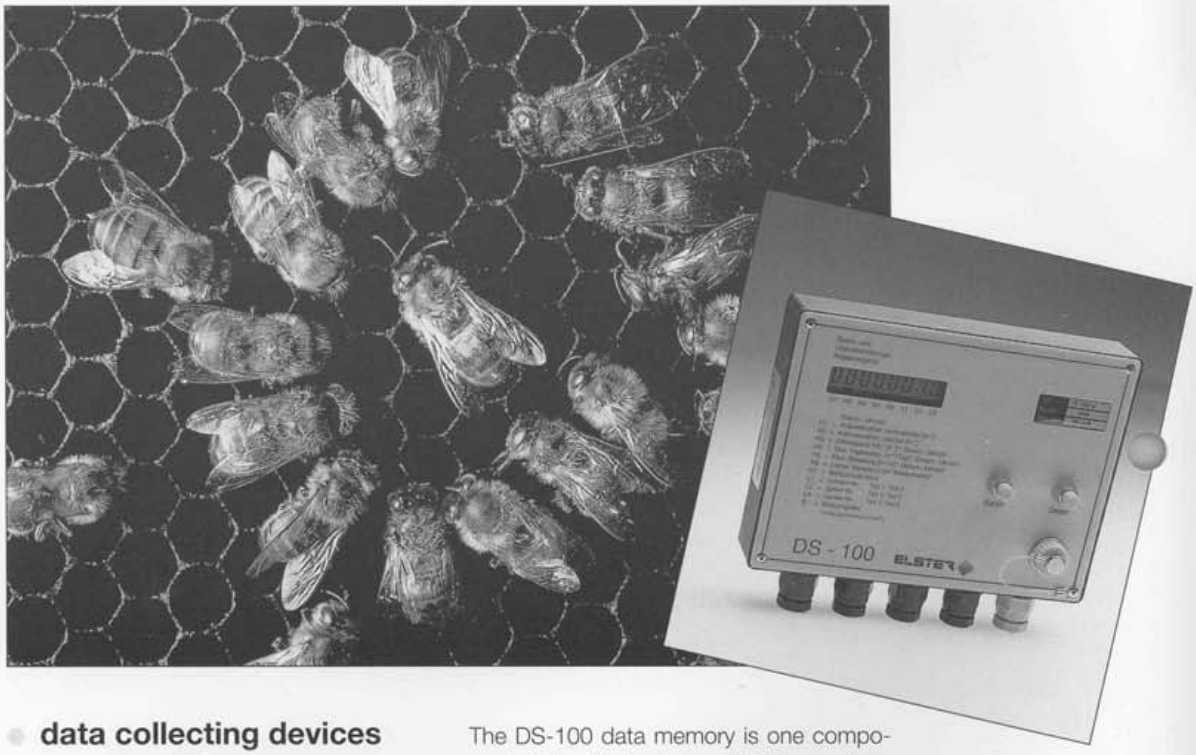
DS-100
Data Memories



This product is discontinued!

ELSTER GROUP

DS-100 data memories



- **data collecting devices for use with gas, water, district heating and electricity**
- **storage of interval values and meter readings**
- **long-term storage on site**
- **special functions for reference monitoring**
- **user-friendly**
- **simple installation**
- **possibility of integration in remote data transfer systems**

The DS-100 data memory is one component of the Elster data collecting system, LIS-100.

The complete LIS-100 system represents a safe and value-for-money possibility of collecting consumption data in the fields of gas, water, district heating and electricity supply. The data can be used for both process control and billing purposes.

As a result of the fully electronic data collection, whereby there is no manual contact with the data chain, errors during the read-out and when the data is transferred can be avoided.

In addition to the DS-100, the EK-86, EK-87 and EK-88 volume correctors are also included in the list of data collecting devices since they contain a data storage function along the same lines as the DS-100.

Operating procedures

The DS-100 data memories have been developed using the most up-to-date microelectronics. They count the volume pulses from gas, water or electricity meters and store them according to a specific period of time. In a recording period of 1 hour, data can be stored for up to 6 or 24 months and can be called up with the help of an AS-100 readout device or a remote data transfer connection.

Besides the interval values, the meter readings at the end of the month and at the time of the readout are also stored and prepared for transfer.

To allow for various applications, several different versions of the data memory are available: battery and mains-operated, one and four channel versions and those with special functions.

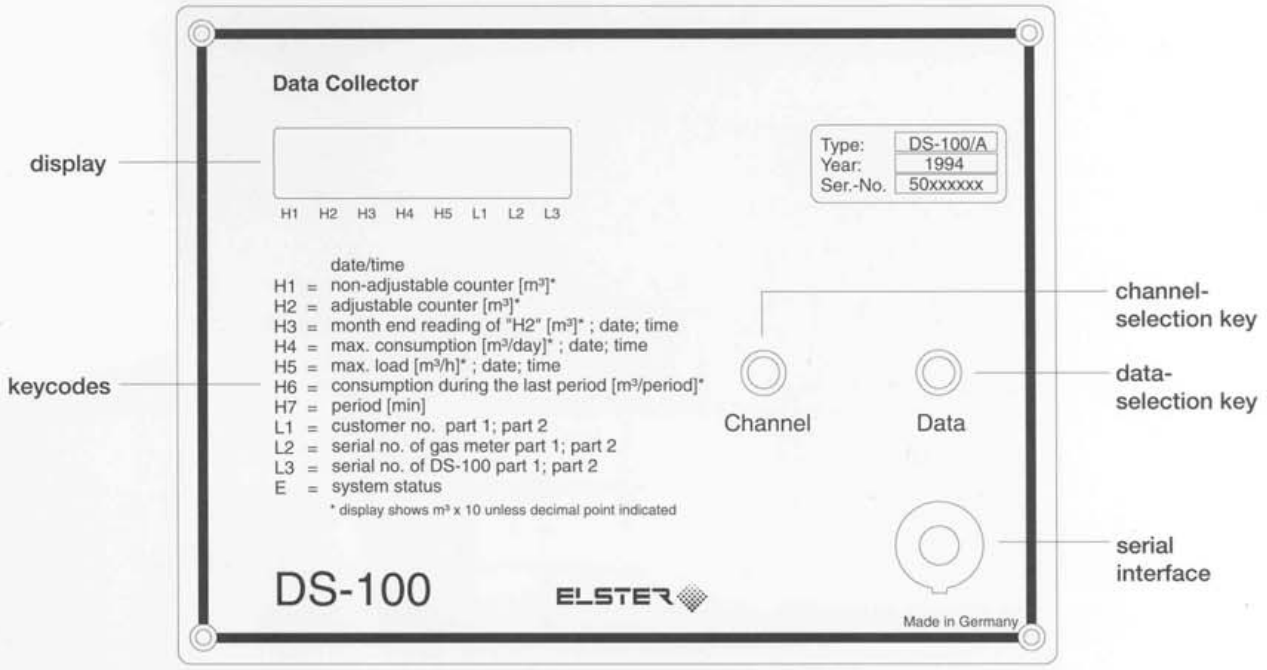
All of the data memories come with housings for wall mounting and are suitable for use in zone 2 hazardous areas.

In order to display the most important data "on site", there is an 8-digit LCD-display as well as two selection keys.

The following data, for each individual channel, can be displayed on all of the data memories:

- meter readings, not adjustable
- meter readings, pre-adjustable
- end-of-month reading for the adjustable counter
- maximum daily consumption
- maximum load
- consumption in the last measurement period
- customer ID number
- serial number of the device
- serial number of the meter
- status
- date
- time

The complete analysis of the data takes place in the data analysis station. Depending on the analysis software being used, the data can be displayed in numerical or graphical form and can be prepared for further processing.



System Integration

The data memories work together with any meter or volume corrector which is equipped with a low-frequency pulser. The only exception is the DS-100/C where a high-frequency pulser is essential for its function as an overspin registration device.

The pulser cables are connected by screw clips inside the device or in a connection box separated from the device for safety reasons.

A 6-pin interface plug can be found on the front of the device and can be used for setting parameters and reading out data. Both readout devices and remote data transfer devices, e.g. the Elster modem EM-100, can be directly connected to this interface.

As an optional feature instead of this interface plug, an optical interface is also available.

Setting parameters and reading out data

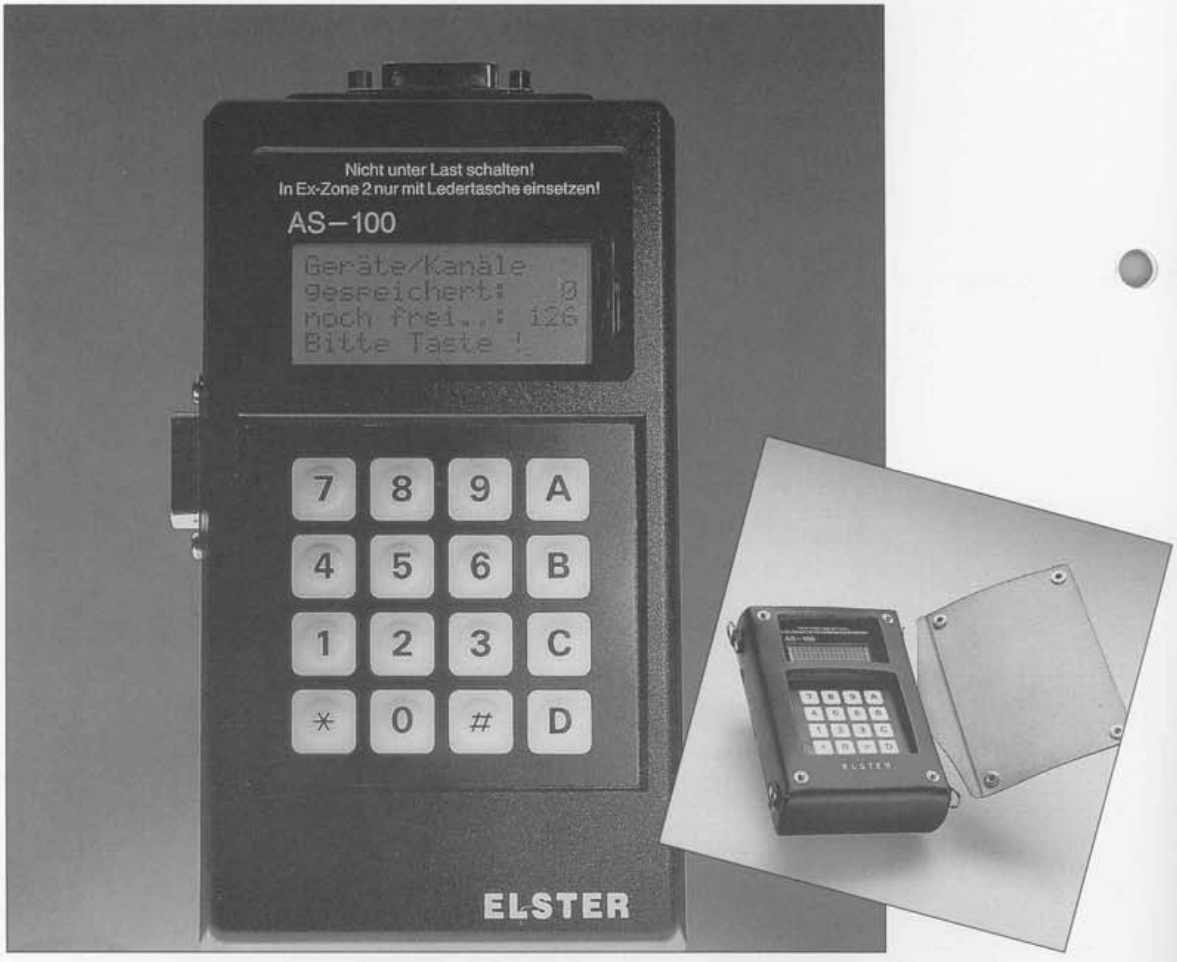
The input necessary for the successful operation of the DS-100 is fed in via the AS-100 readout device. Alternatively, the parameters can be set with the aid of a portable computer and the Elster direct readout program, DAS-100.

The AS-100 readout device is a robust, mobile hand-held terminal and, in addition to setting parameters, it enables over 100 data memory channels to be read out monthly.

No manual input is necessary during the readout procedure as the data is identified by the customer's ID number and the serial numbers of both the device and the meter.

In order to check the data on site, the AS-100 can also produce a brief analysis of the month in question.

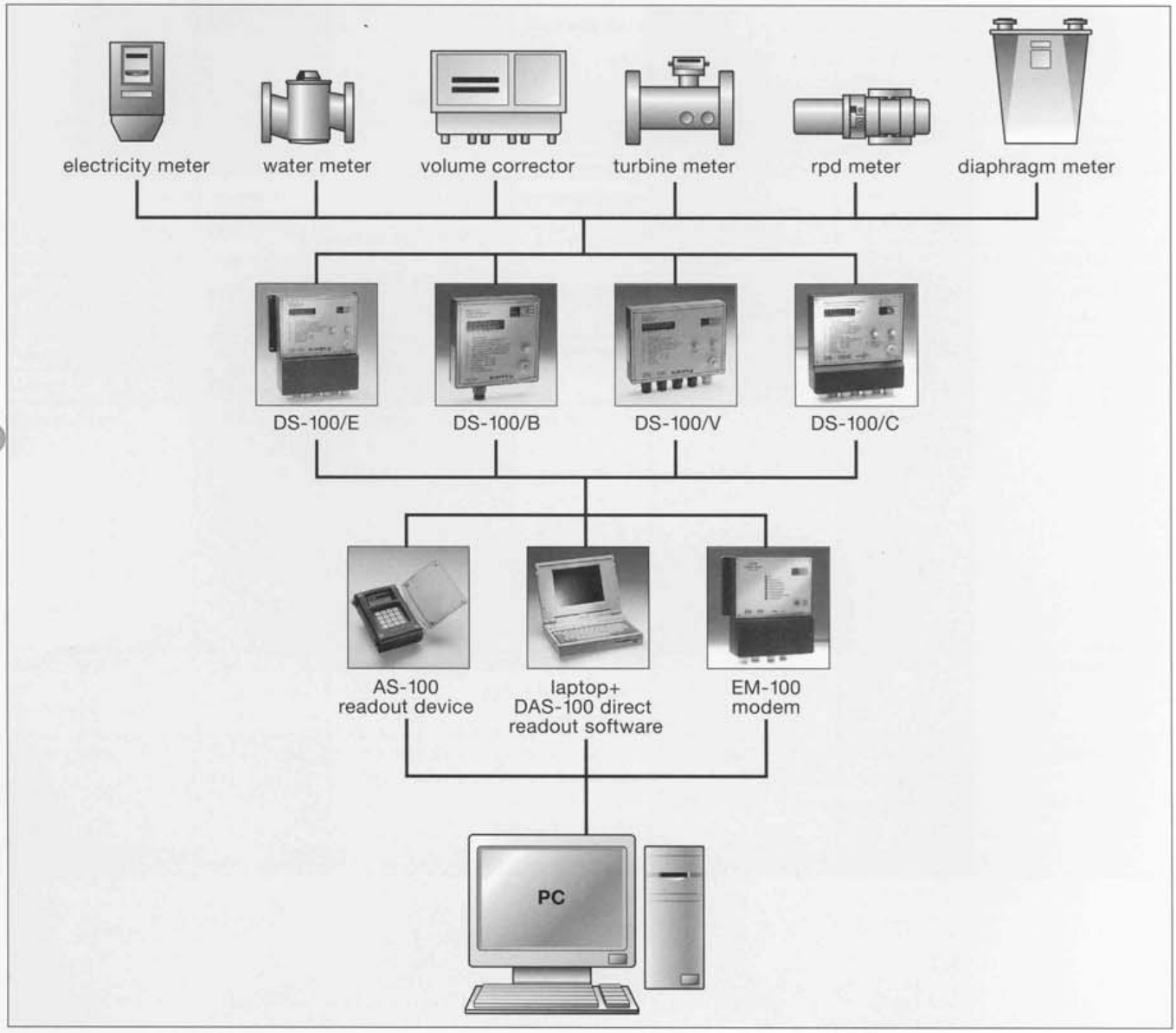
AS-100 readout device



DS-100/B

DS-100/V

DS-100/E



e

Versions of the DS-100

Version	***DS-100/B***	***DS-100/A***	***DS-100/N***
Power supply	2 lithium batteries (IEC type R6 /ANSI type AA) operational life > 5 years	2 lithium batteries (IEC type R6 /ANSI type AA) operational life > 5 years	voltage: 24 VDC ± 20% current consumption: ≤ 50 mA boosting battery for saving data in case of power cut
Housing and dimensions	wall mounting 138 x 155 x 32 mm	wall mounting 184 x 155 x 32 mm	wall mounting 138 x 155 x 32 mm
Weight	approx. 0.4 kg	approx. 0.5 kg	approx. 0.4 kg
Protection class	IP 64	IP 64	IP 64
Ambient conditions	operating temperature: -10 °C to +50 °C	operating temperature: -10 °C to +50 °C	operating temperature: -10 °C to +50 °C
Memory channels	1	4	1
Inputs	1 volume pulse input max. input frequency: 10 Hz	4 volume pulse inputs max. input frequency: 10 Hz	1 volume pulse input max. input frequency: 10 Hz
Cp value (pulse/m³)	0.01 to 100 (decimal)	0.01 to 100 (decimal)	0.01 to 100 (decimal)
Signal sources	- contact (e.g. reed contact) - transistor switch	- contact (e.g. reed contact) - transistor switch	- contact (e.g. reed contact) - transistor switch - Namur pulser
Measuring period (interval)	2, 5, 10, 15, 20, 30, 60 mins, 24 h	2, 5, 10, 15, 20, 30, 60 mins	2, 5, 10, 15, 20, 30, 60 mins
Storage time (when interval = 60 mins)	24 months	4 x 6 months	24 months
Beginning of day	programmable	programmable	6.00 a.m.
Outputs	–	–	–
Output function	–	–	–
Special functions	–	- status signal processing - addition of pulse	–
Special features	intrinsically safe pulse inputs identification: [EEx ib] IIC approval certificate: PTB-No. Ex-89.C. 2024 X	intrinsically safe pulse inputs identification: [EEx ib] IIC approval certificate: PTB-No. Ex-89.C. 2024 X	

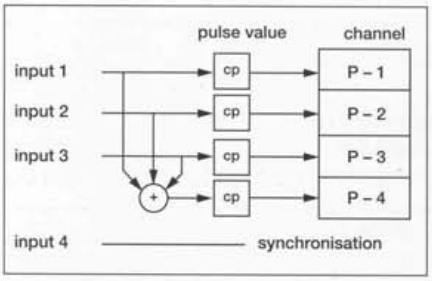
Version	***DS-100/V***	***DS-100/E***	***DS-100/C***
Power supply	voltage: 24 VDC ± 20% current consumption: ≤50 mA boosting battery for saving data in case of power cut	voltage: 100/110/230 VAC current consumption: ≤4 W boosting battery for saving data in case of power cut	voltage: 230 VAC current consumption: ≤4 W boosting battery for saving data in case of power cut
Housing and dimensions	wall mounting 184 x 138 x 32 mm	wall mounting with separate connection box 210 x 215 x 75 mm	wall mounting with separate connection box 210 x 215 x 75 mm
Weight	approx. 0.5 kg	approx. 0.6 kg	approx. 0.6 kg
Protection class	IP 64	IP 64	IP 64
Ambient conditions	operating temperature: -10 °C to +50 °C	operating temperature: -10 °C to +50 °C	operating temperature: -10 °C to +50 °C
Memory channels	4	4	1
Inputs	4 volume pulse input max. input frequency: 10 Hz alternatively (adjustable) 3 volume pulse inputs 1 synchronized input	4 volume pulse inputs max. input frequency: 10 Hz alternatively (adjustable)	1 volume pulse input HF max. input frequency: 3,5 kHz 1 volume pulse input LF max. input frequency: 10 Hz alternatively as switch input 3 switch inputs
Cp value (pulse/m³)	0.001 to 99999,99	0.001 to 99999,99	20 to 99999,99
Signal sources	- contact (e.g. reed contact) - transistor switch - Namur pulser	- contact (e.g. reed contact) - transistor switch - SO (DIN 43864) pulser	- contact (e.g. reed contact) - transistor switch - Namur pulser
Measuring period (interval)	2, 5, 10, 15, 20, 30, 60 mins	2, 5, 10, 15, 20, 30, 60 mins	2, 5, 10, 15, 20, 30, 60 mins
Storage time (when interval = 60 mins)	4 x 6 months	4 x 6 months	4 x 6 months
Beginning of day	programmable	programmable	programmable
Outputs	1	2	2
Output function	- pulse output of one channel - cumulative pulse output - limit warning - synchronized output - tariff output	can be set separately for each output - pulse output of one channel - cumulative pulse output - limit warning - synchronized output - tariff output	A1: HF pulse output - total volume - corrected volume A2: LF pulse output - total volume - corrected volume - overspin volume - LF input volume - switch signal
Special functions	- addition of volumes - limit control - tariff shifting	- addition of volumes - limit control - tariff shifting	- overspin correction
Special features	intrinsically safe pulse inputs identification: [EEx ib] IIC approval certificate: PTB-No. Ex-90.C. 2026 X		PTB approval as registration device for overspin approval certificate: 7.712/91.01 approval certificate: PTB-No. 1.33-3271.87-ELS-N01

Technical details

Special functions of the DS-100/A

Addition of pulses

The pulses entering inputs one to three are added together and stored.
The pulse values of all three channels must in this case be the same. The fourth input channel remains unused.



Recording the status signal

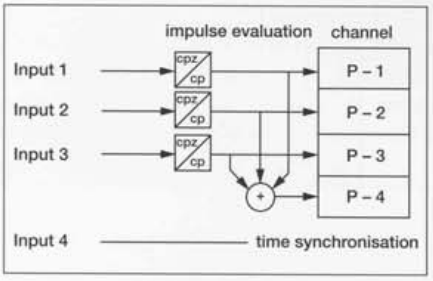
This is used to monitor fault signals such as those which are transmitted by volume correctors. Channels three and four in the DS-100/A can be configured for this function. When this function is activated, both the status signal flanks and their transmission level at the time of the last interval are recorded. Thus, the number of disturbances per interval is recorded in the status channel.

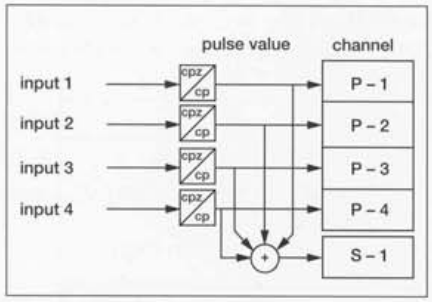
Special functions of the DS-100/V and the DS-100/E

Addition of the volume data

The addition of the volumes in channels one to three is stored. The input for channel four can be used for a synchronised signal.

The addition of the channels one to four adds the number of pulses of all the inputs in their respective channels. On top of this, the total sum of all channels is determined and stored in an extra channel. In this channel, only the meter readings are recorded and not the interval values. If required, the total sum of the pulses can be transmitted via one of the outputs.

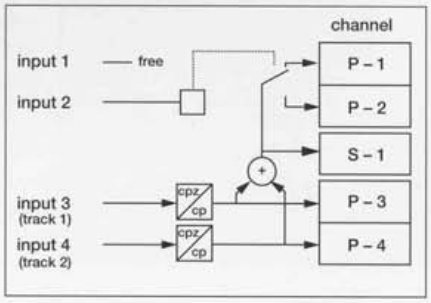




Tariff shifting

Shifting between high and low tariffs enables the use of a simple meter as a "two tariff meter". Here, a DS-100 can be used for one or two meters, whereby two different shifting possibilities are available:
– two-track, combined
– two-track, parallel
The control of the tariff shifting (high tariff HT, low tariff LT) is carried out via a switch input or via the internal clock.

The combined two-track method is intended for the collection of consumption data in a two-track system.
The pulses of both tracks are recorded separately in channels three and four and then added together. The total is then recorded in either channel one (HT) or channel two (LT) depending on which of the tariffs is switched on at the time. The total sum of the meter readings is also stored in a extra channel.

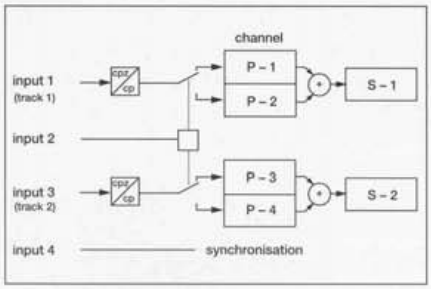


The parallel method enables the HT and LT consumption data for one or two-track systems to be recorded separately. Depending on the HT / LT switch input, the incoming pulses of a meter are distributed into two channels. For the total volume of the meter there are two channels available, both of which only store the meter readings.

Limit control

The limit control function is of particular interest in the monitoring and control of energy consumption.

The limit is a value for the interval or daily counter which is programmable via the AS-100 readout device. When this limit is reached, an output is switched on. Depending on the configuration, the output remains activated until the interval or daily



limit is reached and is then taken off line. In this way, signal lamps, acoustic signal transmitters and also performance switches can be controlled.

Limits can be set for all memory channels as well as for the total volume channels. The first channel that reaches its limit activates the output. The programmed limit can be called up via the data key.

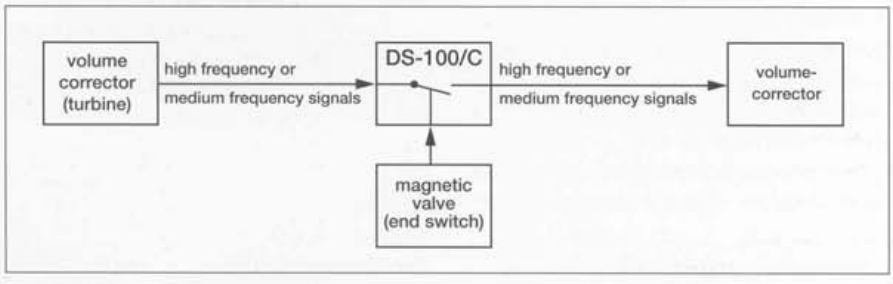
Special functions of the DS-100/C

Overspin correction

The registration device for meter overspin is intended for use in gas supply systems which operate intermittently. By means of the DS-100/C the overspin behaviour of a meter can be recorded and taken into account when billing. This is controlled via switch inputs which take their bearings from the gas consumption device (end switch, magnetic valve, etc.). The volumes are stored and displayed separately under total volume, corrected volume and overspin volume.

In addition to this, there is also an input and a memory channel available for a low-frequency signal, e.g. for the corrected volume pulses from a volume corrector.

The DS-100/C can be operated with all gas meters which are equipped with a medium or high-frequency pulser. Operation is possible with or without a volume corrector. If a volume corrector is used for billing purposes, the DS-100/C acts as an intermediary device. In this case, the volume corrector receives its medium or high-frequency pulses from the DS-100/C.



Technical data

DS-100/N and DS-100/V

Pulse inputs
according to DIN 19234 or NAMUR

no-load voltage:	approx. 8 V
short-circuit current:	approx. 8 mA
switch threshold "on":	2.1 mA
switch threshold "off":	1.2 mA
switch hysteresis:	≥ 0.4 mA
pulse duration:	≥ 100 ms
pause duration:	≥ 20 ms
pulse duration (contact):	≥ 20 ms
pause duration (contact):	≥ 50 ms
maximum frequency:	10 Hz

Output

switch voltage:	≤ 26.4 V
switch current:	≤ 0.5 A
nominal current:	25 mA

DS-100/B and DS-100/A

Pulse inputs

no-load voltage:	approx. 3.5 V
short-circuit current:	approx. 3.5 µA
switch threshold "on":	
– resistance:	≤ 100 kΩ
– voltage:	≤ 1.0 V
switch threshold "off":	
– resistance:	≥ 10 MΩ
– voltage:	≥-2.5 V
pulse duration:	≥ 25 ms
pause duration:	≥ 50 ms
maximum frequency:	10 Hz

DS-100/E

Pulse inputs
according to DIN 43864 or "SO"

no-load voltage:	approx. 20 V
short-circuit current:	approx. 11 mA
switch threshold "on":	5 mA
switch threshold "off":	2.5 mA
switch hysteresis:	≥ 1 mA
pulse duration:	≥ 22 ms
pause duration:	≥ 22 ms
maximum frequency:	approx. 20 Hz

Outputs

switch voltage:	≤ 30 V
switch current:	≤ 0.5 A
nominal current:	25 mA

DS-100/C

HF pulse input
according to DIN 19234 or NAMUR

no-load voltage:	approx. 8 V
short-circuit current:	approx. 8 mA
switch threshold "on":	2.1 mA
switch threshold "off":	1.2 mA
switch hysteresis:	≥ 0.3 mA
maximum frequency:	3.5 kHz
pulse/pause ratio:	1:3 to 3:1

LF pulse input / switch inputs

no-load voltage:	approx. 5 V
short-circuit current:	approx. 1.6 mA
switch threshold "on":	
contact closed or U > 20V	
switch threshold "off":	
contact open or no voltage	
maximum voltage	30 V
maximum frequency:	10 Hz

HF output
galvanically separated transistor output, polarisation safe

switch voltage:	≤ 10 V
switch current:	≤ 25 mA
switch current "on":	≥ 2.1 mA
switch current "off":	≤ 1.2 mA

LF output
galvanically separated transistor output, polarisation safe

switch voltage:	≤ 10 V
switch current:	≤ 25 mA

DS-100 all versions

Serial interface
according to RS-232 C / V.24, short-circuit safe

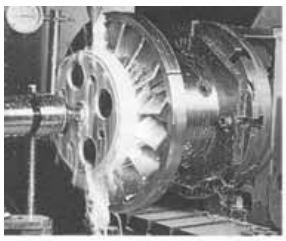
max. input voltage:	± 30 V
input level "1":	≥ 3 V
input level "0":	≤ 0 V
no-load voltage:	approx. 9 V
short-circuit current:	≤ 30 mA

baud rate:	4800 Bd
data bit:	8
stop bit:	1
parity:	none

Ordering

reference number	Data memories and accessories
83 480 000	DS-100/N
83 480 001	DS-100/B
83 480 002	DS-100/V
83 480 004	DS-100/A
83 480 003	DS-100/E
83 480 005	DS-100/C
04 015 403	mains device 24 VDC for DS-100/N and V supply voltage 230 VAC standard rail mounting
on request	mains device 24 VDC with storage battery supply voltage 230 VAC, housing for wall mounting
73 012 352	mounting frame for DS-100/N and /B
73 012 351	mounting frame for DS-100/A and /V
73 011 702	base plate for three-point mounting, for DS-100/E
	base plate for pipe mounting, for DS-100/N and /B
73 012 064	for 1" pipe
73 012 065	for 1 1/2" pipe
	AS-100 readout device and accessories
83 480 100	AS-100/A readout device incl. software, leather case, battery charger and cable to the DS-100
83 480 101	AS-100/D readout device complete unit with printer (not suitable for use in Ex-Zone 2)
	Remote data transfer devices
	IEM-100 industrial modem for universal use in telephone networks, BZT approved
83 480 400	voltage 230 VAC
83 480 401	voltage 24 VDC
83 480 402	DK-10 data concentrator software controlled switching unit for 6 end devices, AS-100 with built-in modem

	reference number
Software for LIS-100 long-term pulse collecting system	
The following programs can be run on MS-DOS.	
AWS-100 analysis software	
Program package for reading in data, administration and analysis of the measured data from the DS-100 data memories and Elster system volume correctors. Data transfer to follow-up systems. Including connecting cable to AS-100.	
3 1/2" diskettes, 1.44 MB	73 012 121
5 1/4" diskettes, 1.2 MB	73 011 174
DES-100 data transfer software	
Transfer of the data from the Elster end devices to the PC for analysis with tabular calculation programs or to a mainframe computer. Possibility of controlling measured data by means of brief analysis. Including connecting cable to AS-100.	
3 1/2" diskettes, 1.44 MB	73 013 565
5 1/4" diskettes, 1.2 MB	73 013 777
DAS-100 direct readout software	
For reading out data and setting parameters in the DS-100 data memories and Elster system volume correctors directly from a PC. Also for calling up current measurement data and status information from Elster system volume correctors.	
3 1/2" diskettes, 1.44 MB	73 012 389
5 1/4" diskettes, 1.2 MB	73 012 390
LSM-100/I control centre software	
Control centre software for calling up data via modem and storing the data for further processing with AWS-100 and DES-100 programs.	
3 1/2" diskettes, 1.44 MB	73 013 767
5 1/4" diskettes, 1.2 MB	73 013 768
LSM-100/II control centre software	
Extension of LSM-100/I for automatic operation.	
3 1/2" diskettes, 1.44 MB	73 013 771
5 1/4" diskettes, 1.2 MB	73 013 772



Electronic devices and systems

Volume correctors with integrated DS-100 data memory

EK-88	can be mounted on to the gas meter or on the wall, no mains supply necessary for operation
EK-87	as EK-88 but including the calculation of compressibility factor in accordance with SGERG-88 wall mounting housing
EK-86	as EK-87 with alternative compressibility factor calculation to AGA-NX-19. And assembly in switchgear cabinet

Temperature corrector

TU-90/T	can be mounted onto the gas meter or on the wall, no mains supply necessary for operation

Long-term pulse collecting system LIS-100

DS-100	data memory in various versions
AS-100	mobile read-out device
EM-100	industrial modem

Software packages for LIS-100

DAS-100	data read-out
DES-100	analysis and data transfer
AWS-100	automatic analysis and graphic data display
LSM-100	control centre software for data transfer

Registration and control devices

ETG-3000	registration device for measurement data with monitoring function
GAS-ASS	automatic station control

Test devices

DA-400	flow indicator with counter test function
PGM-300	test generator for volume correctors and data memories

A market-oriented product range

The Elster Group offers a market-oriented product range in the field of measurement and control as well as data communication.

The range of products for gas measurement covers diaphragm gas meters for industrial, commercial and domestic purposes, turbine gas meters, quantometers and test gas meters.

Meter regulators, domestic regulators and other regulating devices for low, medium and high pressures make up the supply programme in the field of gas pressure and flow control.

Elster can claim more than 500 years of know-how in the development and production of such devices and this provides the foundation for innovation, quality, competence and safety.

For further information, please do not hesitate to get in touch with us.

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