SIEMENS

Automatic Batchmeters DN 25 ... DN 80
7MR1112-..., 7MR1212-..., 7MR1412-..., 7MR1612-...
7MR1113-..., 7MR1213-..., 7MR1413-..., 7MR1613-...

Instructions Bestell-Nr.: C73000-B5176-C20-5

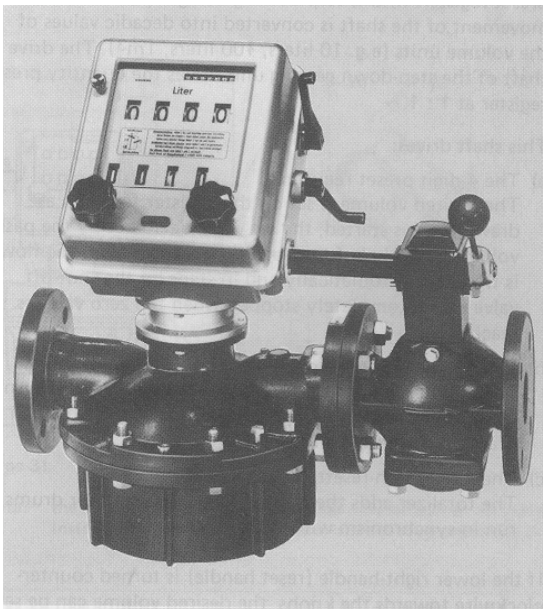


Fig. 1/1 Automatic batchmeters DN 50

Contents Page

Contents Page

NOTE

The instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contigency to be met in connection with installation, operation or maintenance.

Should further information be desired or should particular problems arise which are not covered sufficiently for the Purchaser's purposes, the matter should be referred to the local Siemens Sales Office.

The contents of the instructions shall not become part or modify any prior or existing agreement, commitment or relationship. The Sales Contract contains the entire obligations of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements of the instructions do not create new warranties or modify the existing warranty.

⚠ WARNING

Dangerous voltages may be present in this equipment during operation. High pressure and aggressive media may be applied to this equipment.

Failure to properly maintain this equipment can result in severe personal injury or substantial property damage.

Only qualified personel should work on or around this equipment.

The successful and safe operation of this equipment is dependent on proper handling, installation, operation and maintenance.

QUALIFIED PERSON

A "qualified person" is one who is familiar with the installation, construction and operation of the equipment and the hazards involved. In addition, he or she has the following qualifications:

- Is trained and authorized to operate and maintain equipment in accordance with established safety practices for equipment with electrical circuits, high pressure and aggressive media.
- Is trained in the proper care and use of protective equipment in accordance with established safety practices
- Is trained in first aid

1 Description

1.1 Design and application

The automatic batchmeter, consisting of the metering mechanism, step-down gearing unit quantity preset register and fast shut-off valve, is used to draw off (dose) specific, previously set liquid quantities. It also enables additive quantity counting of several doses.
The fast shut-off valve is opened by hand and is automatically closed when the preset quantity is reached.

1.2 Mode of operation

The rotary motion of the mechanism shaft of the rotary-piston meter is transmitted through a pair of gear wheels (replaceable) to the driving shaft of the step-down gearing unit which is located between the meter and the quantity preset register. In this step-down gearing unit, the rotary movement of the shaft is converted into decadic values of the volume units (e.g. 10 liters, 100 liters, 1 m^3). The drive shaft of the step-down gearing unit drives the quantity preset register at 1 : 1.

This shaft drives:

a) The 4-digit preset register.
The desired volume is set on this register. As soon as drawing off is started, the set value decreases by the passed volume. Shortly before reaching the zero value, the flow is throttled automatically and in steps by the shut-off valve and is completely stopped when the zero value is reached.

b) The 4-digit resettable drum-type counter.
This register counts from zero up to the set value. Counting is continued if the register is not reset to zero when drawing off has been finished.

c) The 7-digit non-resettable totalizer.
The totalizer adds the total volume. The counter drums run in synchronism with those of the counter.

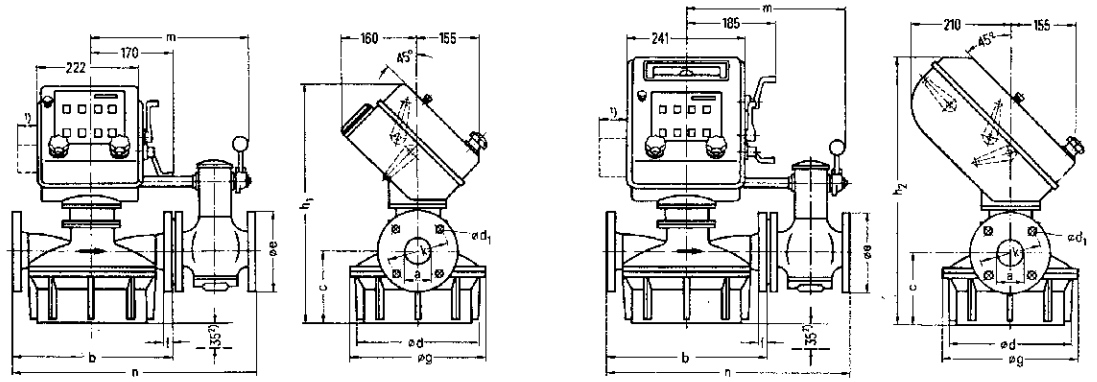
If the lower right-handle (reset handle) is turned counter-clockwise towards the knobs, the desired volume can be set on the preset register with the two knobs. The register can be reset to zero by moving the upper handle (zero setting handle). Interlocking elements in the quantity preset register prevent wrong manipulations. With the valve opened, neither the pressetting nor the zero position can be actuated during drawing off. In the case of an emergency, the drawing-off process can be stopped by pressing the emergency button.

1.3 Technical data

Preset register	4 adjustable drums, drum diameter 64 mm, digit height 17 mm
Register	4 resetable drums, drum diameter 64 mm, digit height 17 mm The circumference of the fastest (right-hand) drum is divided into 100 equal divisions
Totalizer	7 drums, drum diameter 19 mm, digit height 3.5 mm

	Liter	Liter	Liter	m^3	m^3
Preset register: largest adjustable volume	999.9	9 999	99 990	999.9	9 999
Value of 1 rotation of fastest drum	1	10	100	1	10
Totalizer: max. readable volume	999 999.9	9 999 999	99 999 990	999 999.9	9 999 999
Value of 1 rotation of fastest drum	1	10	100	1	10

Permissible liquid temperature	Max. 80 °C if the quantity preset register is mounted directly on the metering mechanism of the rotary-piston meter. Max. 150 °C if a cooling attachment is fitted between the quantity preset register and the metering mechanism of the rotary-piston meter. In this case, the shut-off valve must also be provided with an intermediate unit. (Higher temperatures on request)
Quantity preset register	Scale inclined by 45 °

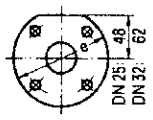


Type 31 Type 35

Note: the shut-off valve is usually installed downstream of the meter.
Installation upstream of the meter is more advantageous if pressure surges can be expected.

Rated size	Rated pressure	ϕa	b	c	ϕd	ϕd1	Number of holes	ϕe	f	ϕg	h_1	h_2	ϕk	m	n
DN 25	PN 10	25	210	90	140	14	4	140	16	155	445	494	85	241	345
DN 32	PN 10	32	210	90	140	18	4	140	16	155	445	494	100	241	345
DN 50	PN 6 and PN 10	50	325	147	250	18 (14 with PN 6)	4	165	17	275	497	552	125	318	500
DN 80	PN 4 and PN 6	80	410	185	340	18	4	190	18	365	535	597	150	396	642

Fig. 1/2 Automatic batchmeter, dimensions in mm



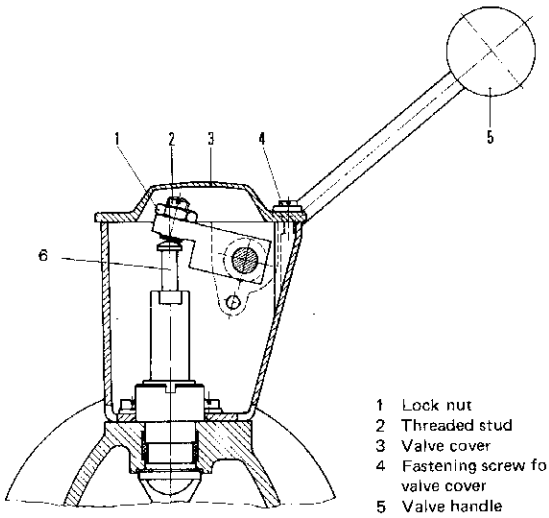
Flange flattened on upper side with rotary-piston meters DN 25 and DN 32.

1) Space provided for additional switches.
2) Space required to replace the valve seal with DN 25 and DN 32.

2 Installation and operation

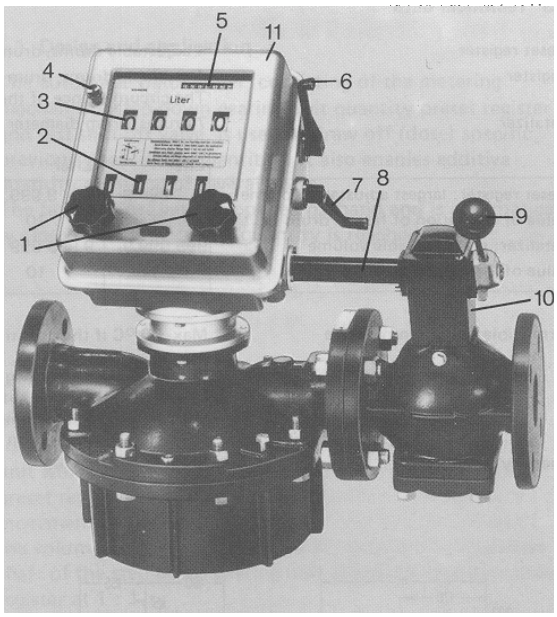
2.1 Installation

The quantity preset register is factory-delivered mounted on the metering mechanism and ready for operation after the meter has been installed in the pipeline. The max. permissible temperature of the liquid must be observed (Section "Technical data"). After connecting the automatic batchmeter to the pipeline, fill the line with liquid before putting into operation. Slowly increase the flow in the pipe up to the maximum flow so that the pipe, rotary-piston meter and valve are vented.



1 Lock nut
2 Threaded stud
3 Valve cover
4 Fastening screw for valve cover
5 Valve handle
6 Plunger

Fig. 2/1 Partial sectional view of shut-off valve



1 Rotary knobs
2 Preset register
3 Counter
4 Stop pushbutton (emergency knob)
5 Totalizer
6 Zero-setting handle
7 Reset handle
8 Protecting tube
9 Valve handle
10 Shut-off valve
11 Quantity preset register housing

Fig. 2/2 View of automatic batchmeter DN 50

2.2 Operation

Adjusting the shut-off valve

The shut-off valve is factory-adjusted for the liquid stated in the order. If a different liquid is measured, inaccurate quantities must be expected. The delivered volume will not exactly correspond to the preset volume.

The closing moment of the valve can be changed by adjusting the threaded stud (2, Fig. 2/1). First unscrew the fastening screws (4) of the cover and remove the cover (3) from the valve body. After loosening the lock nut (1), turn the threaded stud (2) by approx. 1/4 to 1/2 turn (clockwise for smaller delivery, counterclockwise for larger delivery). After adjusting, secure threaded stud with lock nut (1) again. Following the setting, check with the valve closed that there is at least 0.3 mm play at the pressure point between the threaded pin (2) and the rounded end of the plunger (6). If no space is present, the valve can easily be opened, even in the switched off condition. Replace the cover and fasten with the screws (4).

Note:

In the case of batchmeters which are officially calibrated, a protective seal must always be destroyed. The adjustment must therefore be carried out in the presence of an official of the Bureau of Standards concerned or in our factory.

2.3 Adjusting the volume to be drawn off

Turn the reset handle (7, Fig. 2/2) counterclockwise to the front stop. The volume to be preset can be adjusted using the two rotary knobs (1) as described below.

Right-hand knob: Counterclockwise rotation sets the right-hand digit;
clockwise rotation sets the second digit from the right.

Left-hand knob: Clockwise rotation sets the third digit from the right;
counterclockwise rotation sets the fourth digit from the right.

During the setting, the drums must lock into position exactly. Once the required volume has been set, return the reset handle (7) to the stop by moving clockwise.

The shut-off valve throttles the flow in steps before the preset volume has been reached, and closes immediately when the preset register indicates zero.

If the same volume is to be metered again, it is only necessary to move the reset handle (7, Fig. 2/2) forwards again (counterclockwise) and then backwards. The preset volume then appears again on the preset register. The valve can then be opened for the next filling.

If several filling operations are to be combined by adding the individual meter readings, the register should only be set to zero after these operations have been completed. Push the zero-setting handle (6) backwards – a mask covers the drums at the same time – and the register is set to zero again.

The non-resettable totalizer counts all partial volumes. If the filling operation is to be interrupted prematurely, press the stop pushbutton (4) to close the valve instantaneously. The interrupted filling operation can be continued by reopening the valve; a new filling volume can also be set if required.

The stop pushbutton must only be actuated in real emergencies as sudden closing of the valve produces liquid hammers which can damage meters, pipes and fittings.

3 Maintenance

See Instructions C73000-B5176-C15 for maintenance on the metering mechanism.

The quantity preset register requires no special maintenance.

When cleaning the plant or rooms, the register should be protected from water by a plastic cover.

N o t e : in the case of officially tested or calibrated batchmeters, the quantity preset register, metering mechanism and valve head are lead-sealed. These seals are destroyed during maintenance and the Bureau of Standards concerned must f i r s t be informed.

3.1 Maintenance of the drying insert (Fig. 3/1)

The main components of the drying insert are the drying chamber with transparent lock and replaceable drying cartridge. The cartridge contains strongly porous crystals which absorb moisture when dry (blue color). The color of the crystals changes as soon as moisture is absorbed. When the color changes to pink, the cartridge is saturated with moisture and must be replaced. Two cartridges are required for each meter to ensure continuous operation.

Replacing the drying cartridge

A drying cartridge can be used for approx. 4 to 6 weeks, or even shorter in unfavorable conditions. Replace the cartridge as shown in Fig. 3/1 when the crystals are pink. Immediately before replacing, dry the spare cartridge and replace the used cartridge once the former has cooled down. The drying chamber must not be opened longer than required to change the cartridge as the moistrue in the register will increase. Screw the lock of the drying chamber hand-tight after replacing the cartridge.

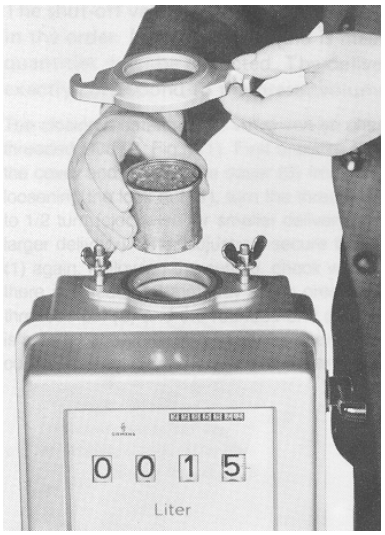


Fig. 3/1 Replacing the drying cartridge

Drying the cartridge

Dry the cartridge by heating for approx. 1 hour at 150 °C. The crystals burn at higher temperatures and become ineffective. Place the cartridge with the transparent face downwards so that moisture can escape through the holes pointing upwards. The crystals are dry when their color has turned blue again. Then allow the cartridge to cool a little, preferably in the packaging unit or in a dry location, and then insert into the register with the transparent face upwards.

3.2 Replacing the perspex pane

The top of the housing (11, Fig. 2/2) must be removed in order to replace the pane. Loosen the four screws on the housing and remove the two rotary knobs.

The pane can be removed from the inside of the housing after removing the screws and the pane holder. Remove adhesive residues from the surface and out of the groove. Insert a new pane and fix with two holders. Fill the groove uniformly with adhesive up to the edge of the pane. Ensure that the space below the holders which have already been fixed is completely filled with adhesive. Then screw on the remaining holders.

3.3 Cleaning the shut-off valve (Fig. 3/2)

To clean the valve, first take apart as described below. Loosen the cover (22) and cautiously pull off so that the valve disk (17) cannot fall out and be damaged (spring (23) pushes the cover up). After loosening and removing the two nuts (14 and 20) secured by a punch mark, the gaskets (16 and 18) can be replaced. Only use **original gaskets**. After inserting the new gaskets, secure the nuts (14 and 20) again by a punch mark.

All valve parts can be cleaned with a soft brush and the usual detergents and rinsed in water. Assemble the valve in the reverse order.

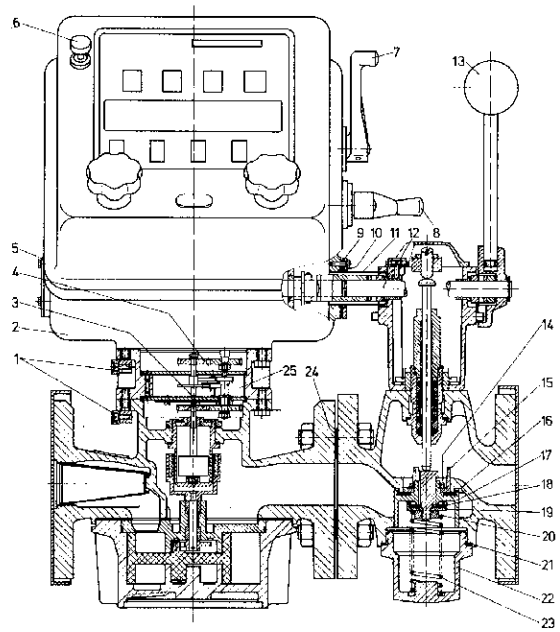
3.4 Maintenance of packing sleeve

The automatic batchmeter is delivered with two versions of this tappet bushing:

- Standard design (batchmeter Ord. No.: 7MR .. 12- ...)
- Bellows design (batchmeter Ord. No.: 7MR .. 13- ...)

Both designs are maintenance-free. Limited operating conditions apply to the bellows design: max. 3 bar and max. 40 °C. This design is used if absolute leak-tightness is required with particularly corrosive media.

Batchmeters delivered before 1979 are fitted with a grease-filled packing sleeve. This design can be identified by the greasing socket which must be tightened by 1/2 turn per week. Only Siemens special grease may be used. When ordering, also specify the liquid to be measured.



1 Front sealing point, drawn displaced by 90 °
2 Meter mechanism flange
3 Interchangeable gears
4 Intermediate gears
5 Cover
6 Emergency stop pushbutton
7 Zero-setting handle
8 Reset handle
9 Pressure disk
10 Gasket
11 Protecting tube
12 Coupling shaft
13 Valve lever
14 Nut, secured by punch mark
15 Guide
16 Gasket
17 Valve disk, complete
18 Gasket
19 Small valve disk
20 Nut, secured by punch mark
21 Gasket
22 Cover
23 Spring
24 Gasket
25 Step-down gearing

Fig. 3/2 Sectional view of automatic batchmeter

3.5 Dismounting and mounting the quantity preset register (Fig. 3/2)

Loosen the pressure disk (9, Fig. 3/2) on the quantity preset register and push in the protecting tube (11) up to the stop. If necessary, unscrew the quantity preset register or the shut-off valve.

When removing and laying down the preset register, ensure that the interchangeable gears (3) and the driving shaft are not damaged.

Before fitting the preset register onto the step-down gearing unit, check that both interchangeable gears of the mechanism are secured by spring washers and nuts. When replacing the gears, note that they have left-hand and right-hand threads.

Slightly grease the mechanism flange (2).

Place preset register onto step-down gearing unit so that the gears are not damaged.

Tighten the preset register gently using hexagon screws. Slide the pressure disk (9, Fig. 3/2) and the gasket (10) onto the protecting tube (11), insert the coupling shaft (12) onto the side of the preset register and push on the protecting tube up to the stop. Now flange the shut-off valve with stud screws and gasket (24) onto the rotarypiston meter. First check that the coupling shaft sits correctly on the shut-off valve. After mounting the shut-off valve, the lateral play of the coupling shaft must be 0.5 to 2 mm; shorten the coupling shaft if necessary. The coupling shaft must not have any play in its direction of rotation since it must exactly transfer the angular rotation of the quantity preset register to the valve.

Push protecting tube into the valve casing. Fix gasket with pressure disk on preset register.

Check that the shut-off valve, after being set to the flow position, can be closed again by pressing the stop pushbutton (6, Fig. 3/2) without getting jammed. The hexagon screws for securing the register on the mechanism flange can then be tightened carefully.

Then check the function of the stop pushbutton again. If the coupling shaft jams when switching off, loosen the screws again and adjust the position of the register so that jamming is eliminated.

3.6 Dismounting and displacing the shut-off valve (Fig. 3/2)

The valve is usually mounted downstream of the meter. If pressure surges are expected, the arrangement upstream is more adventageous. (If switches are mounted on the quantity preset register, displacement is not possible.)

Loosen the pressure disk (9) and push the protecting tube (11) into the preset register up to the stop. Loosen the flange screws and disconnect the valve. Disassemble the valve lever (13), coupling shaft (12), protecting tube (11), pressure disk (9) with gasket (10) and the cover (5).

Reassembe in the reverse order on the other side of the meter.

3.7 Changing the flow direction

In this case, dismount the quantity preset register and the shut-off valve as described in Sections 3.5 and 3.6 and reassemble in the reverse order after displacing the preset register.

Siemens AG
Bereich Automatisierungs- und
Antriebstechnik
Geschäftsgebiet A&D PA
D-76181 Karlsruhe

Siemens Aktiengesellschaft

Order No. C73000-B5176-C20
Printed in Germany
AG 02.91 8 GB