

MANUAL FOR MJK LIQUID SAMPLER 780

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General

MJK Liquid Sampler 780 is designed to make samples from lakes, rivers, sewage systems, pumping stations etc. It can be used in fixed installations or as a portable unit. The sampler operates from the manual panel, or is controlled from a flowmeter or a timer.

The sampler can be connected directly to an MJK 713 Ultrasonic flow converter for flow proportional sampling. The MJK Liquid Sampler 780 consists of 3 modules: a combined valve / compressor unit, a control panel and a power supply, all located inside a rugged stainless steel enclosure. The parts that need to be cleaned are mounted externally.

Operation

MJK Liquid Sampler 780 is operated from the front panel or can be controlled via external signals from flowmeter, timer, or MJK Integrator 783. The MJK Liquid Sampler 780 can be connected directly to MJK Flowmeter 713 for flow proportional sampling.

MJK Liquid Sampler 780 uses pressure and vacuum for sampling. When the sampler receives a start signal from either the control panel or an external signal, the sample tube is pressurized to clear residue from the previous sample. The vacuum remains on until the sample glass is full. Then the glass is again pressurized to clear the surplus liquid from leaving the required sample (20 ml to 500 ml) in the glass.

When the required level is reached, the outlet valve opens and the sample runs into the collecting container.

MJK Liquid Sampler 780 has a built-in alarm system. If the sample tube is blocked during the filling of the sample glass, the alarm operation re-pressurizes the sampler to clear the obstruction. The cycle then starts again. If the sample glass is not filled at the second try within a preset time, the sampler will not be blocked.

The control system of the sampler is in a sturdy design and is unaffected by electrical noise. The sampler can be operated manually or controlled from a flowmeter or timer.

However if another cycle is desired, all cycle functions are located on a terminal block, so the control of the internal functions and monitoring can be taken over via a PLC or pc.

Specifications

Sampling

Cycle time: App. 2 min (adjustable to 1 - 10 min)
Amount: 20 ml to 500 ml
Suction height: 0,75 bar abs
Pressure: Max. 1 bar (when flushing the sample hose)
Sample temp.: Max. +60 °C
Environment: -20 - +60 °C
Suction tube: PVC, inner dia. 9,0 mm x 2 m
Outlet tube: Silicone, inner dia. 9,5 mm x 1 m

Mechanical data

Housing: Stainless steel
Enclosure: IP 55
Weight: 5 Kg
Dimensions: 165 mm x 410 mm x 235 mm (w x h x d)

Electrical data

Supply: 110/220V AC and 12V DC
Consumption: 30 W during sample, 2 W stand by.

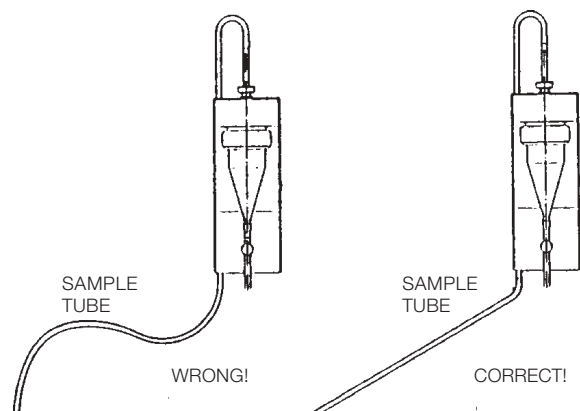
Mechanical mounting

The sampler should be mounted on a wall or bracket. On the back of the cabinet there is 2 'keyhole' slots at the top and a slot at the bottom. Note, that 230 mm free space is required at the left hand side of the cabinet in order to be able to open the upper part of the cabinet. The sample tube is immersed in the channel or the basin where the sample will be taken from. The outlet tube runs to the sample container, where the samples are stored until analysed. The tubes may be extended as required.

Please observe the following when mounting the sampler:

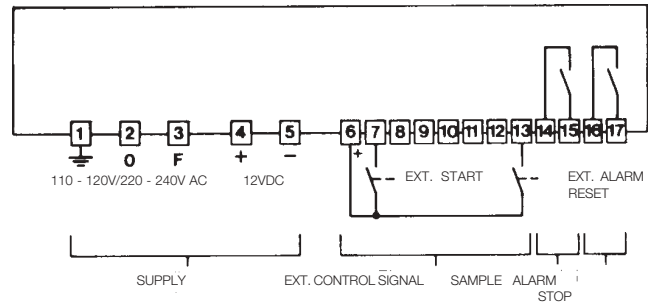
- The sampler must be mounted vertically so the inlet and outlet can have the most optimum position. Vertical mounting is required for utilizing the measuring scale on the sample glass.
- The maximum vacuum capacity of the sampler is 8m WG (0,8 bar) and is used to lift the sample from an lower liquid surface, and to overcome pressure loss in the sample tube.
- The sampler must be mounted so the sample container can be placed underneath. Under particular circumstances it can be placed elsewhere, since the measured sample is forced out of the sample measuring chamber.
- During the summer months we recommend to avoid exposing the sample container to the heat of the sun.
- During the winter it will be necessary to protect the sampler from frost. The sampler is able to function down to -20° C, since the sampler is drained after every sample; there is only a minor risk for frost damages. On the other hand, the sampler must be protected, warmed and insulated when it is placed outdoors. Consideration as to air temperature, temperature and size of every sample as well as how long the samples have to be in the sample container, must be taken.

The sample tube must be straight without kinks when the vacuum cycle begins. (See illustration below).



Terminals

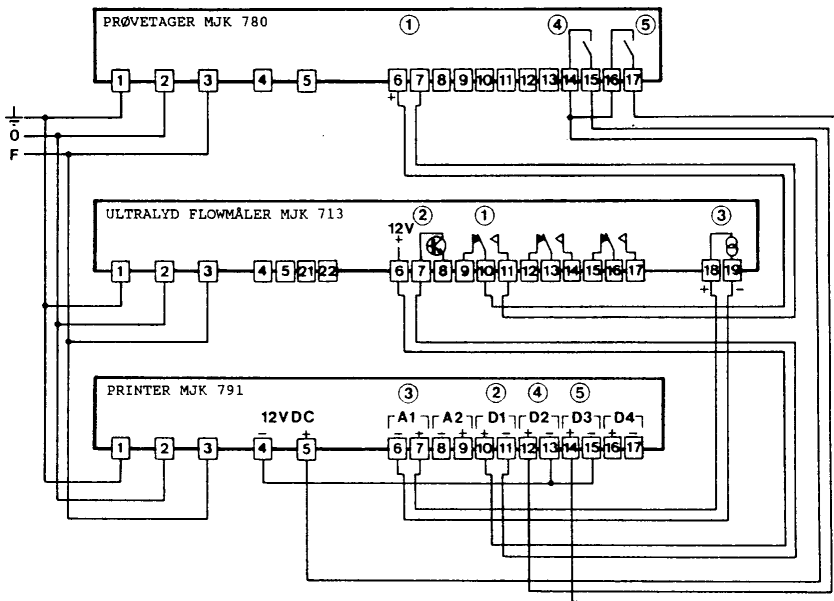
The terminals for the electrical connection is found underneath the lid behind the sample glass. The sampler cabinet is opened with the enclosed cabinet key. Connect the sampler in accordance with the diagram.



Examples

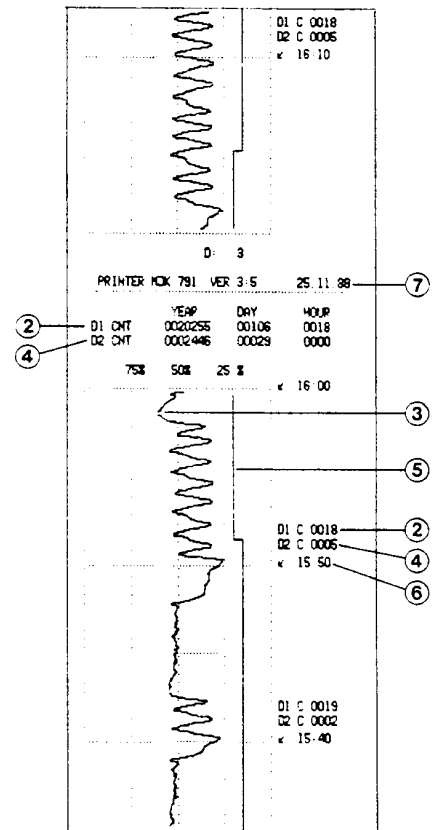
Flow proportional liquid sampling together with MJK Flow Converter 713.

This example show also th econnection of a MJK PRINTER 791 for recording of flow and sampling.

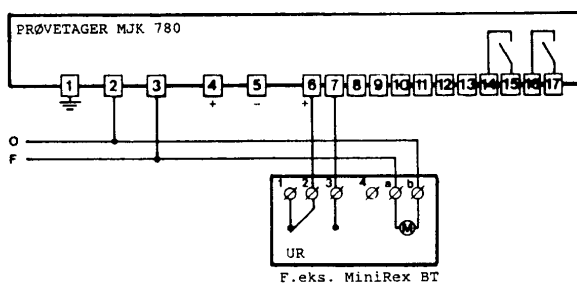


Printout example

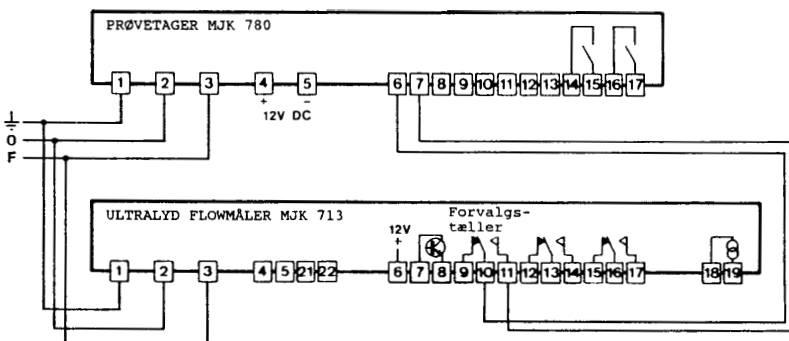
- 1 Start liquid sampler
- 2 Totalization of flow
- 3 Graphic presentation of the flow
- 4 Sample count
- 5 Alarm registration from the sampler
- 6 Time
- 7 Day - month - year



Timer controlled liquid sampling



Flow proportional liquid sampling



Operation

The sampler is operated on the control panel. The symbols have the following meaning and function.



Start/stop of the sampler.

The function is an electrical memory function, so the chosen position (start or stop) is maintained also after a power failure. The sampler will continue taking samples or will stop according to the previous position. The green LED indicates that the sampler is on and ready (stand by) when a start signal occurs.



Manuel sampling.

By depressing the start key, a sample cycle is started. This function is always active and can be used alone or together with an external control signal. The green LED indicates that the sampler is in operation.



Alarm (reset).

The ALARM key resets the sample cycle. When there is an alarm, the light diode flashes (yellow), as described in section 9. It continues to flash until the key is activated to reset the alarm.



Pressure indicator

This LED (green) indicates that the compressor has pressurized the sample glass in order to:

- * to purge out the previous sample from the sample tube.
- * to purge out excess liquid during adjustment of the sample volume.
- * to flush the set sample volume into the sample can.



Vacuum indicator.

This LED (green) indicates that there is vacuum in the sample glass when

- * the sampler pulls up the sample in the sample glass.

Start-up

When the sampler is mounted and electrical connections completed, the sampler is ready for start-up.

Ensure that the sample tube is immersed in the channel or basin where the sample will be taken. Position the outlet tube so that it reaches the sample container.

Adjust the sample volume from 20 ml – 0,5 l. The adjustment is made by loosen the nut and pushing the measuring pipe until the lower edge of the pipe is on the level with the line on the sample glass, which corresponds to the desired flow.

Connect the power supply when the measuring pipe has been adjusted to the correct height. The ON/OFF key activates the green diode light and the sampler is ready for start (standby) when the “Start” key is pressed. When the sampler is started, the green diode light will light. During operation the compressor will be audible. The green diode lights in the symbols for pressure and the vacuum, indicate the internal valves are controlling the compressor.

Sample cycle

The sample sequence is presented below:

Function:	Purge	Suction	Volume adjustment	Sample pump out (outlet to sample can)	Purge
Signal:	—T 1—	—Level—	—T 2—	—T 3—	—T 1—
Compressor:	xx				
Pressure	xxxxxxxxxxxxxx			xx	
Vacuum		xxxxxxxxxxxxxx			
Level detection		x			
Outlet valve open				xxxxxxxxxxxxxx	
Alarm			—T 4—		

As shown in the diagram, the compressor starts when the sampler is started. When starting, the valves are switched out to put pressure on the sample glass, to remove any previous sample. The purge time is determined by the timer T1 (purge).

When time T1 has elapsed, the valves switch to create a vacuum. The sample glass and the water will be pulled into the sample glass, until the level electrodes are activated.

When the level electrodes have been activated, the valves are switched over again, to put pressure on the sample glass. Excess sample will be blown back in the sample tube. Pressure continues until the time, determined by the timer T2 has elapsed.

The outlet valve opens under pressure and the sample is dropped into the sample container. The outlet valve remains open for time T3 (purge).

It is possible to switch off the last purge by cutting off the connection "Purge" 2.

The sequence contains an alarm, which activates if the sample does not contact the electrodes by a preset time T4 (alarm). This alarm protects the sampler from continuous cycles caused by blockage. However since the compressor creates a 4 bar pressure, it is not very likely that blockage will occur.

If the sampler does not succeed to activate the level electrodes the second time before the time T4 has run out, the sampler will stop and prevent further starts. To indicate the alarm, the yellow alarm flashes and the alarm relay is activated. To make the sampler start again, the alarm state has to be reset by activating the "alarm" key.

Setting of sequence times

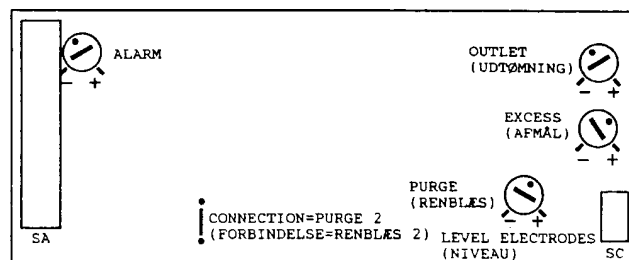
The sequence time is factory adjusted, to a total sample time of approx. 2 minutes.

The 4 timers have the following time ranges:

Timer (function)	Range	Factory setting
Purge	T 1: 30 - 150 sec	30 sec
Volume adjustment	T 2: 30 - 150 sec	30 sec
Outlet (outlet)	T 3: 30 - 150 sec	30 sec
Alarm	T 4: 30 - 150 sec	60 sec

The sequence times are adjusted with the potentiometers on the back of the control unit. To adjust the time, the control unit must be removed. Switch off the sampler (ON/OFF) key and unscrew the 4 screws, which hold the front panel to the control panel. The control unit is integral with the front panel. When the control unit has been removed the sampler can be started again and the adjustment made.

There are no dangerous voltages present at the control unit, so it can be touched during operation. When the desired adjustment has been made, depress ("ON/OFF" key) to avoid short circuit during mounting, and the control unit attachment.

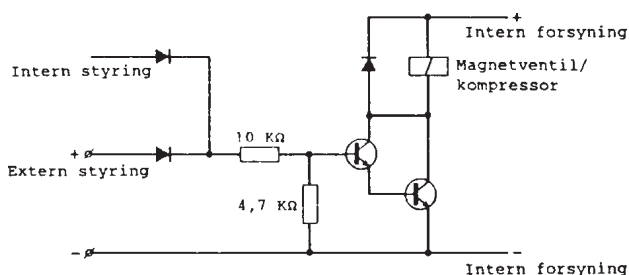


External sequence

The sampler can be controlled externally, e.g. from a PLC.

When an external control is connected, it works in parallel with the internal control, so that it is possible to select a manual sample controlled by the internal system of the sampler, at the same time as the external control.

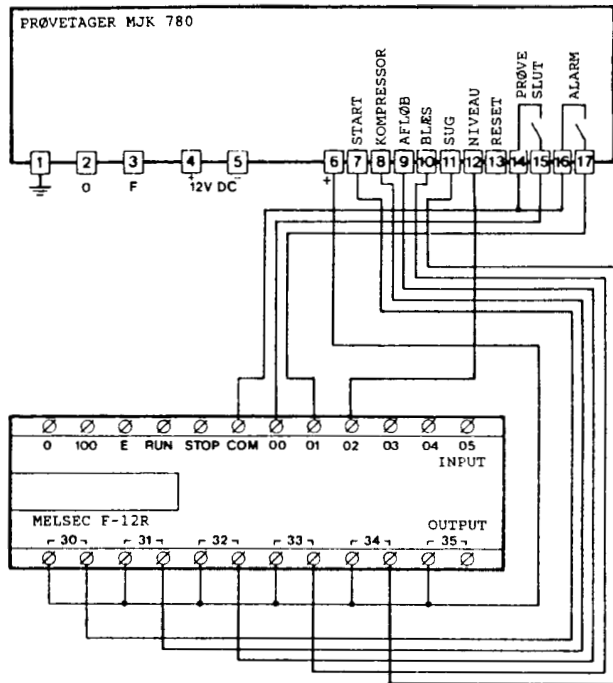
The inputs are semi-conductor inputs as indicated at the diagram.



The input signal should be not activated <0,5 V DC
Activated 5-24 V DC.

Example of PLC controlled sample

The sampler is connected to a PLC. In the example a MITSUBISHI MELSEC F-12R is displayed, but any PLC can be used.



Miscellaneous

Maintenance

The sampler must be kept clean of dirt on the following points:

- * The sampler glass must be kept clean on the inside
- * The level electrodes in the top of the sample glass must be cleaned
- * The sample tube and the outlet tube must be cleaned

How often the cleaning is necessary, depends on how often the sampler is used. In municipal sewage plant, we recommend monthly cleansing, where the sampler tube is put in a bucket with 10% diluted hydrochloric acid. Hydrochloric acid is a degreaser and cleans grease and sludge from all inside surfaces.

Start the sampler 2-5 times dependent on how much coating there is on the inside surfaces.

The plastic house inside between the electrodes should be cleaned.

The outlet tube should be removed during cleaning.

Spare parts

Item nr.: Description:

Complete units

- | | |
|--------|---|
| 803510 | control unit complete with front panel |
| 803515 | Power supply unit
115/230V AC and 12V DC |
| 813510 | Valve / pumping unit |

Other parts

- | | |
|--------|--|
| 595120 | Suction hose, PVC, dia. 9,0mm.
Specify length. |
| 595121 | Discharge hose, Silicone, dia. 9,5mm,
Specify length. |
| 595110 | Sample glass |
| 570025 | O ring for sample glass, silicone,
dia. 75mm x 8mm |
| 570027 | O ring for measuring pipe, nitril, dia. 10 x 3mm |

Dimensions

