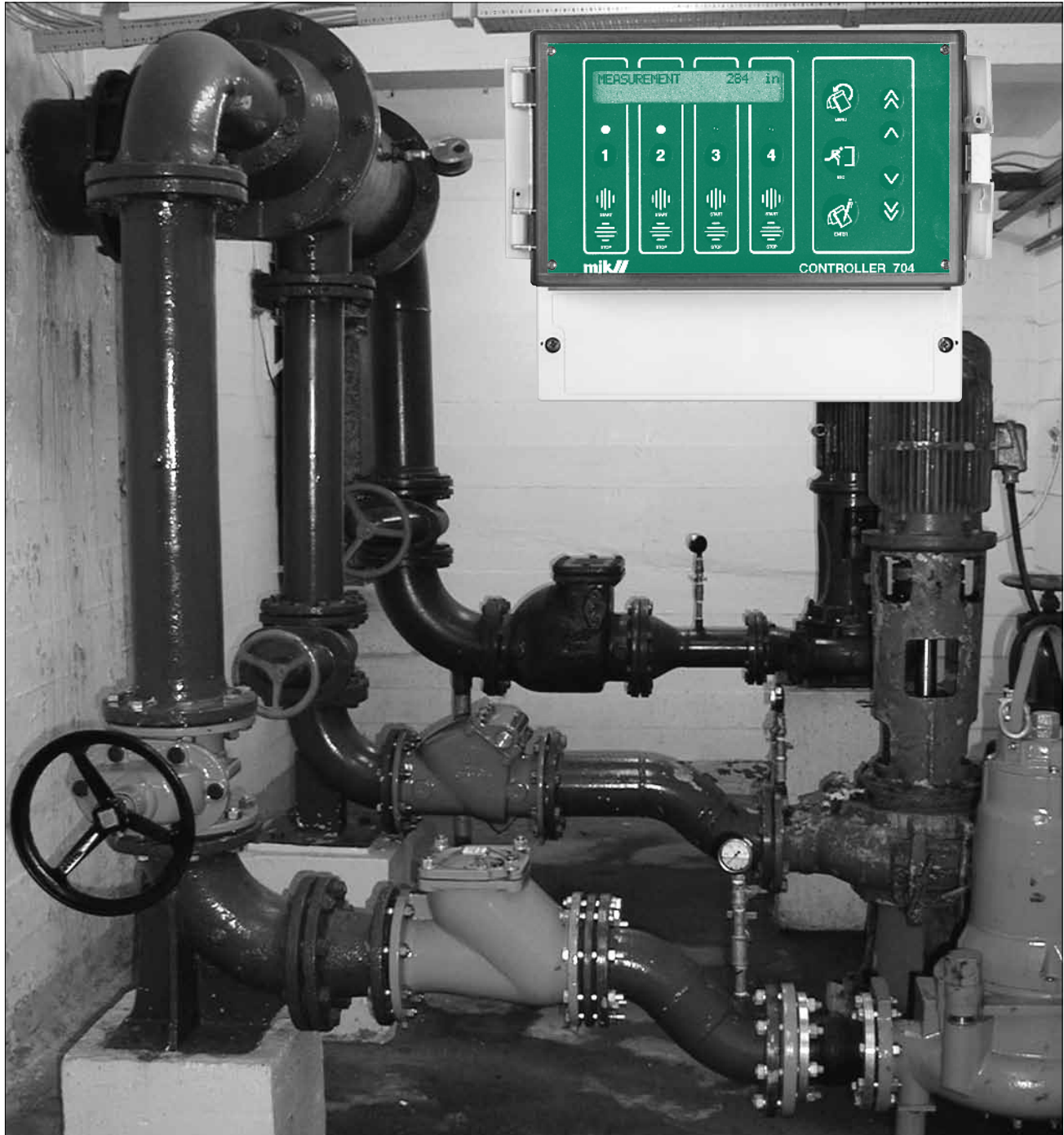


MJK 704 Pump Controller



UL Approvals

UL-CUL listed, File # E 194021 UL 508/c22: 2 No. 142-M1987.

CE Certificate of conformity

This product complies with the requirements concerning electromagnetic compatibility (EMC) stipulated in Council directive no. 89/336/EEC of 3rd May 1989, altered at directive no. 92/31/EEC, on the approximation of the laws of the Member States relating to electromagnetic compatibility.

We declare that the product complies to the values stipulated in EN 50081-1 and EN 50082-1.

Ex approval of ultrasonic sensor

Shuttle® Ultrasonic Sensor type 192L0570 is approved for mounting in explosive atmospheres in zone 2 areas in accordance with EN 50021:1999.

The approval are given by Demko under test no. 99Y.126020X.

Therefore, Shuttle® is suited for use in potentially explosive atmospheres (Zone 2, Ex nA II T3), but not in Zone 1 or Zone 0 areas. The Shuttle® has not been approved for any other hazardous rated zones.

Contents

1	General	5
1.1	Hydrostatic measuring system.	5
1.2	Ultrasonic measuring system.	5
2	The front panel	5
3	Operation	6
3.1	Functional indications	6
3.2	F0 - Level measuring.	6
3.3	F1 - Number of starts / Operational time	6
3.4	F2 - Capacity / Quantity	6
3.5	F3 - Pumping station volume.	6
3.6	F4 - Level Start/Stop and F5 - Level Set/Reset	6
3.7	F6 - Forced start and F7 - Forced stop	7
4	Programming of pump controller	7
4.1	Language	7
4.2	Key in access code	7
5	Programming of main functions	8
5.1	Select unit measurement.	8
5.2	Select unit volume.	8
5.3	Select unit flow	8
5.4	Select special functions.	8
5.4.1	Change the access code	8
5.4.2	Code only installation / all settings.	8
5.4.3	Measurement in level / elevation + level	8
5.4.4	Depth pumping yes / no.	8
5.4.5	Relay for depth pumping	8
5.4.6	Duty periods between depth pumping.	8
5.4.7	Depth pumping duration.	8
5.4.8	Offset active / not active.	8
5.4.9	Offset	8
6	Sensor menu - data for mounting	9
6.1	Select sensor / span	9
6.2	Select comma	9
6.3	Select span	9
6.4	Key in elevation	9
6.5	Sensor level.	9
6.6	Max level.	9

7	Output relays programming	10
7.1	Controlling of emptying / filling	10
7.2	Alternating normally / in pairs	10
7.3	Relay programming	10
7.4	Relay operating / not operating	10
7.5	Relay controlling / alarm	10
7.6.1	Relay level alarm / system error	10
7.6.2	Relay NC / NO	10
7.6.3	Relay set>reset (high) / set<reset (low)	10
7.7.1	Relay alternating / directly controlled	10
7.7.2	Level not in use / in use	10
7.8	Relay delay	10
8	mA output programming	11
8.1	mA output 0-20mA / 4-20mA	11
8.2	mA output 4-20mA / 20-4 mA	11
8.3	mA output 4 mA = (elevation)	11
8.4	mA output 20 mA = (elevation)	11
9	Pump flow programming	11
9.1	Flow calculation yes / no	11
9.2	Level for volume: Stop	11
9.3	Level for volume: Start	11
9.4	Size of the volume	11
9.5	Correction factor	12
10	Mounting	13
10.1	Pressure Transmitter	13
10.2	Ultrasonic Sensor	13
10.3	Electrical connection	14
10.3.1	MJK 704 with pressure transmitter	14
10.3.2	MJK 704 with ultrasonic transmitter	14
10.4	Connection box for transmitters	15
11	Adjustments	15
11.1	Level measurement	15
11.2	Zero point, span and response time	15
12	Maintenance	15
13	Changing the software	15
14	Dimensions	16
15	Order numbers	17
16	Specifications	18
17	Settings form	19
18	Operational overview	20
19	Menu structure	21

1 General

Thank you for choosing a MJK 704 Pump Controller. The MJK 704 Pump Controller is a microprocessor controlled pump controller, which is delivered with a hydrostatic measuring system or ultrasonic measuring system. The pump controller can control up to 4 pumps, valves etc. It is appropriate for plants, where the controller manages the data transfer to a central computer. The pump controller is operated with a combined menu and functional keyboard, making the installation and operation simple and clear.

1.1 Hydrostatic measuring system

A MJK 704 Pump Controller delivered with a pressure transmitter, covering measuring ranges from 10 to 100 ft. The pressure transmitters are developed for measurement of waste water and liquids with suspended solids. All transmitters are designed as 2-wire 4-20 mA transmitters.

Measurement is based on the following principle. A pressure transmitter is lowered to

the bottom of the solids to measure the hydrostatic pressure. The pressure transmitter transmits an electrical signal proportional to the pressure, resting on the pressure transmitters membrane. The pressure transmitter is connected to the amplifier, where the signal is used for level indication, for limits for start-, stop signals and alarms, as well as for the level proportional 0-20/4-20 mA output signal. Pressure transmitters are supplied in 2 versions for absolute and gauge pressure.

1.2 Ultrasonic measuring system

A MJK 704 Pump Controller delivered with a 30 kHz ultrasonic sensor with a resolution of 0.3 in. The ultrasonic sensor both sends and receives signals. In the amplifier the signals received from the sensor are converted to a signal proportional to the level.

With the ultrasonic sensor, the system has built in temperature compensation for accurate measurements at varying temperatures.

2 The front panel

LED indicators

There are 4 LED's for indication of operation and alarms. The LED's is lit when an output is active - green when the relay output is used for control and red when used for alarm. The diode flashes during the delay period.

Display

2 x 24 characters text display for indication of user menus and measuring values. When the keys have not been pressed for approx. 1 min, the display will change automatically to show the level.

MENU

By activating the MENU key, a shift is made to the next main menu to view the menu.

Arrow keys

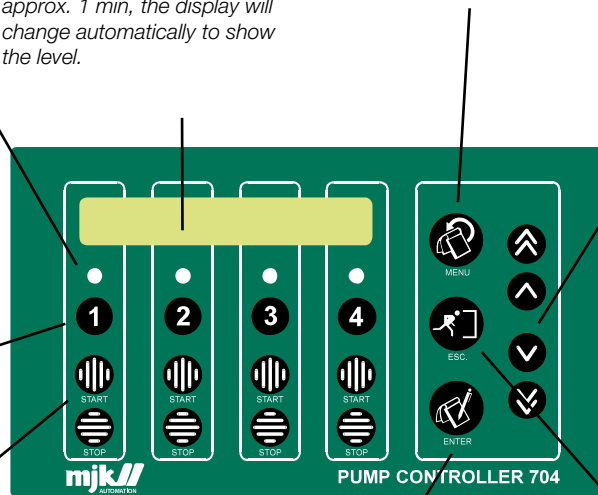
The arrow keys are used for altering the current setting. In a submenu with the possibility to make a selection the top line will show the valid setting, the bottom line shows the alternative setting (in paranthesis). Use the arrow keys to select the desired settings. Input and output numbers are also changed by activating the arrow keys. By activating the ↑-key, the number of the display will increase. By activating the ↓-key the number will decrease the number.

1 to 4

By pressing one of the keys from 1-4 (denominated as #) a reading of the built in datalogger is obtained for number and period of time, the output relays have been active. If flow calculation is applied, a second press will show the pump capacity and the volume pumped out. Third press will show the volume pumped out for the entire pumping station.

START and STOP

The level corresponding to the output relay is displayed by pressing one of the 8 start/stop keys. If the START key and one of the number keys are pressed simultaneously, the pumps are forced to start. If the STOP key and one of the number keys are pressed simultaneously, the pumps are forced to stop.



ENTER

With the ENTER key selections are confirmed. Also a shift from a main menu to a submenu is carried out with the ENTER key.

ESC

(ESCAPE = undo):

This key will take you back to the previous menu or undo a choice. By pressing the ESC-key 2-3 times you will always return to level indication.

3 Operation

The keys under the display give access to the functions used in the daily operation. The MENU key gives access to programming of the pump controller. The programming settings can be locked separately with an access code; ie. a code must be keyed in to get access to the programming menus.

3.1 Functional indications

When the pump controller is connected to the mains the display will show:

PROGRAM	8340XX
STARTUP	WAIT A MOMENT

If the pump controller is activated for the first time, the display will show the following:

KEY IN NEW VALUES
PRESS ENTER

Now the pump controller can be configured. The settings can always be altered later on.

If the sensor type is changed, or if an output relay is either put into service or out of service, the program will be reset and new values must be keyed in.

3.2 F0 - Level measuring

When the programming is carried out, function F0, level measuring in the display is shown:

MEASUREMENT	13.2 ft
-------------	---------

If the pump controller is set up for level output according to a given elevation, both the level and the level relative to the elevation is shown in the display:

MEASURING	4.5 ft
ELEVATION	5.6 ft

3.3 F1 - Number of starts / Operational time

By pressing one of the keys 1-4 the number of starts are displayed as well as the running hours / operation time for any of the relays 1-4 in use. If the relay is configured for operational relay the relay number is shown with a prepositive P for pumps. If the relays are configured as alarms an A will be shown.

P#	STARTS 4
OPERATIONAL TIME	2.9 h

If the MENU key is pressed while the functional indication F0 is in the display, access is given to reset the counter and time counter:

P# RESET COUNTER?	
YES: ENTER	NO: MENU

P# RESET TIME COUNTER?	
YES: ENTER	NO: MENU

3.4 F2 - Capacity / Quantity

If key 1-4 is pressed while F1 is in the functional display, menu F2 will show:

P# CAPACITY	82 GPM
QUANTITY	5508 CF

The capacity of each single pump is shown at this point, as well as the pumped out volume. When pressing the MENU-key while functional indication F2, access is given to reset the capacity and water quantities (if code is not applied, see menu 3.3):

P# RESET CAPACITY	
YES: ENTER	NO: MENU

P# RESET QUANTITY	
YES: ENTER	NO: MENU

3.5 F3 - Pumping station volume

When pressing key 1-4 while functional indication F2 shows on the display, menu F3 will appear:

PUMPING STATION	
QUANTITY	27803 CF

Displayed here is the pumped out volume for the entire pumping station, as the sum of the pumped out volumes from all the individual pump's. If the MENU key is pressed, the volume can be reset:

P2 RESET QUANTITY	
YES: ENTER	NO: MENU

3.6 F4 - Level Start/Stop and F5 - Level Set/Reset

By pressing START or STOP keys, the levels activating the relays can be read. If the relay is configured for controlling, the levels for starting and stopping the pump can be read. If the relay is configured as an alarm, the levels for setting and resetting can be read.

If the pump controller is configured for filling (see menu 6.1) the start level will be lower than the stop level, and vice versa if the pump controller is configured for emptying.

LEVEL 2	START 1.80
	STOP 0.20

If the relay is configured as a level alarm, there is an alternative choice of adjusting the set levels to be either higher (high alarm) or the contrary (low alarm) to the reset level in menu 6.6.3.

LEVEL 1	SET 1.90
	RESET 1.70

When adjusting a level, press one of the arrow keys; consequently the setting will flash. Set the wanted value with the arrow keys and confirm with ENTER. Double arrow alters the value quickly, single arrow alters the value slowly.

The highest value acceptable is the equivalent of the max. level which has been programmed in menu 5.7. The lowest value acceptable is 1% of the measuring range of the sensor (reading in menu 5.1). The lowest range acceptable between start and stop is 1% of the max. level programmed into menu 5.7.

NB: If level indication with elevation is applied, the values must be keyed in according to the elevation.

3.7 F6 - Forced start and F7 - Forced stop

Forced controlling is carried out by pressing one of the keys 1-4 as well as the corresponding key for either start or stop.

If the level is between the start and stop levels the pumps stay started or stopped when the keys are released. Above or below the interval between the start and stop levels, the pump is only started/stopped while the keys are pressed. The same applies if the level is not in use (menu 6.7.2).

If a pump which is configured for alternating control is run forced, it is run as directly controlled during the forced running. As soon as the forced running is stopped the pump returns to alternating operation.

4 Programming of pump controller

When function F0 shows in the display press the MENU key for access to the programming menus (if code is not applied, see menu 3.3). Change between the main menus by repeatedly pressing the MENU key. Press ENTER to change to sub menus. Make choices and adjustments in the sub menu with the arrow keys and confirm with ENTER.

4.1 Language

Choose between languages with the arrow keys.

4.2 Key in access code

If access code has been chosen, key it into this menu before the following menus become accessible. Key in code with keys 1-4. Do not confirm with ENTER.

When the code is keyed in, access is given to make alterations of all settings for 10 minutes after last key is pressed.

5 Programming of main functions

Access to the configuring menus are obtained by pressing the MENU button.

5.1 Select unit measurement

Level indication and unit of elevation can be chosen as:

ft, in, m, bar, kPa, cm, mm, l/s

5.2 Select unit volume

Unit of volume can be chosen between

Gal, CF, m³, l

5.3 Select unit flow

Unit of flow can be chosen between

MGD, CFS, G/mi, m³/h, l/s

5.4 Select special functions

In this menu the submenu's for the special functions can be activated or deactivated.

5.4.1 Change the access code

This menu is used to change the access code. Press the MENU button if the code should remain unchanged.

5.4.2 Code only installation / all settings

The access code can block the access to installation settings only; ie. settings normally accessible via the MENU button, or it can block the access to all settings.

If ALL SETTINGS is selected, changes are made via menu 2.0 where the access code is entered, whereafter access is given to all settings.

5.4.3 Measurement in level / elevation + level

Select level indication as either absolute measurement or as relative measurement in relation to a given level.

The level is the zero level chosen for the current location, ie. the pumping station level above sea level. If a pumping station is situated ie. 12 ft above sea level, a level measurement of 20 ft will be indicated as 32 ft.

If elevation + level is selected, all start/stop values is programmed in relation to the level.

5.4.4 Depth pumping yes / no

This menu activates or deactivates the depth pumping function.

The function is used if the well should be emptied to a level below the normal stop level in a fixed time interval.

5.4.5 Relay for depth pumping

Select which output relay that should start the depth pumping.

5.4.6 Duty periods between depth pumping

This menu is used to enter the total number of starts (counted on all outputs) that should trigger a depth pumping.

5.4.7 Depth pumping duration

This menu is used to enter the interval (in seconds) the pump should continue to run after the normal stop level is reached.

5.4.8 Offset active / not active

If OFFSET ACTIVE is selected, all start- and stop levels will be offset according to the selection in the next paragraph:

5.4.9 Offset

Select the offset value of all start / stop levels.

6 Sensor menu - data for mounting

Menus which are accessible, depend on the setup. The pump controller can be either an ultrasonic measuring system or a hydrostatic measuring system.

The flow chart at the end of this manual, shows which of the following menus are accessible during system setup.

6.1 Select sensor / span

In ultrasonic measuring systems, the sensor and the amplifier are calibrated together, and the measuring range of the sensor can be read.

In the hydrostatic measuring system, the type of sensor applied can be coded into the system and the measuring scale of the sensor can be read.

6.2 Select comma

When choosing selectable span in hydrostatic measuring systems, the comma is adjusted to set where the decimal point will be in the level readings. The choices are:

1.234, 12.35, 123.4 or 1234

6.3 Select span

When choosing the selectable span with hydrostatic measuring systems, the span is set with the arrow keys. Double arrow changes the value before the comma, single arrow changes the value after the comma.

6.4 Key in elevation

If level indication with elevation has been chosen, the elevation is keyed in at this point.

For ultrasonic systems the elevation is keyed in as the 0-point of measuring.

For hydrostatic measuring systems the sensor is placed in the zero point of the measurement, therefore the elevation for the sensor is keyed in. Use arrow keys for this setting. Double arrow changes the value before the comma, single arrow changes the value after the comma.

6.5 Sensor level

For ultrasonic measuring systems the sensor elevation above the zero point is keyed in. Use the arrow keys for this setting. Double arrow changes the value before the comma, single arrow changes the value after the comma.

6.6 Max level

The max level is set to restrict the setting of start and stop level. Use arrow keys for this setting. Double arrow changes the value before the comma, single arrow changes the value after the comma.

7 Output relays programming

In this menu the function for the four output relays are programmed. In menu 6.1 and 6.2 joint settings for the four outputs are programmed. In menu 6.3 to 6.8 the individual outputs are programmed.

7.1 Controlling of emptying / filling

The relays which are configured for control, are programmed to control either an emptying or a filling function. At the emptying function the pump-start levels are higher than the pump-stop levels. At the filling function the pump-start levels are lower than the pump-stop levels.

7.2 Alternating normally / in pairs

At this point the outputs programmed to run as alternating (see menu 6.7.1), can be set up to run normally or in pairs.

At normal alternating, there is alternating between all the outputs which are set up to alternate.

At alternating in pairs, output 1 and 2 are alternated as one of the pairs and between output 3 and 4 as the other pair. If alternating in pairs is chosen all four outputs are used as alternating, and it is therefore not possible to configure any of the relays as alarms or as directly controlled.

7.3 Relay programming

Choose with arrow keys or key 1-4 which output relay is to be programmed, confirm choice with ENTER.

7.4 Relay operating / not operating

Choose whether to have the relay operating or not operating.

7.5 Relay controlling / alarm

Set whether the relay is to be an alarm relay or a pump controlling relay.

When the relays are activated, the light emitting diodes under the display will show, whether it is an alarm relay or a control relay: When an alarm relay is activated the diode will flash a red light; when a control relay is activated the diode will flash a green light.

7.6.1 Relay level alarm / system error

If the relay is set for alarm relay, set the alarm to be a level (high/low) alarm or an alarm for system error.

7.6.2 Relay NC / NO

Choose the relay function for the output, (Normally Open) or (Normally Closed).

7.6.3 Relay set>reset (high) / set<reset (low)

Set the level alarm to be registered as a high or low alarm. If the alarm needs to be a high alarm, choose set > reset. If the alarm needs to be a low alarm choose set < reset.

7.7.1 Relay alternating / directly controlled

The output relays can be set as directly controlled or alternating. At direct control, the start and stop values which have been keyed in for the individual relay activate the outputs, nothing else activates them. At alternating operation the alternating pumps will take it in turns to start up in a cycle, so that when a start level is activated the next relay in the cycle is activated. If several start levels are passed several pumps will consequently be started.

7.7.2 Level not in use / in use

To avoid all pumps running at the same time in alternating operation, levels can be left unused.

One level minimum, must be left "in use" for the pump controller to function correctly. If the pump controller is set up to alternate in pairs at least one of level 1 and 2 as well as either level 3 or 4 must be left "in use".

7.8 Relay delay

To avoid short error conditions, or levels continuously activating the relays, a delay time can be set. If the connected pumps are not started simultaneously for over load reasons, the delay time can be set differently for the relays.

In case of an error condition or level continuously exceeding, the diode will flash. If the condition proceeds after the delay time has expired the relay will be activated and the diode will be permanently lit.

8 mA output programming

Set the voltage analog for the pump controller.

8.1 mA output 0-20mA / 4-20mA

Set the mA output as either a 4-20 mA signal or a 0-20 mA signal.

8.2 mA output 4-20mA / 20-4 mA

Set the voltage output to be either 4-20 mA signal or 20-4 mA signal.

If (0 or 4) - 20 mA is chosen, a high level will give a high mA-signal and a low level a low mA-signal.

If 20 - (4 or 0) mA is chosen, a high level will give a low mA-signal and a low level a high mA-signal.

8.3 mA output 4 mA = (elevation)

If 4-20 mA has been chosen in 7.2, key in which level the low mA value represents. If 20-4 mA has been chosen, the value represented by the high mA is set here.

8.4 mA output 20 mA = (elevation)

If 4-20 mA has been chosen in 7.2, key in here which level the high mA value represents. If 20-4 mA is chosen, key in the value represented by the low mA.

9 Pump flow programming

At flow calculation a known volume between two levels is programmed. The pump controller is then able to calculate the flow from the measured level differences.

In the flow calculation the fact, that inlets can occur simultaneously with pumping out is taken into consideration.

To calculate flow the following conditions must be met:

1 All start / stop levels must be outside the interval in which calculation takes place.

The flow calculation can only be carried out between the lowest set start level and the highest set stop level with a margin of *sensor span/200*.

2 The connected pumps must regularly run on their own to obtain reliable flow measuring.

If the above mentioned conditions are not present the following message will appear in the display, when entering menu 8.0 is attempted:

PUMP FLOW NOT POSSIBLE
SEE THE MANUAL

This message will also appear if the pump settings are changed, so the conditions are no longer present. If flow calculation is needed again after this, the level must be set so the conditions are present again.

If it is established that all stop / stop levels comply with the above conditions, access is given to menus 8.1 to 8.5.

9.1 Flow calculation yes / no

Choose whether flow calculation is desired.

9.2 Level for volume: Stop

Set the level where known volume stops. If the control is set for the filling function, the stop level is the highest level. If it is set for emptying, this is the lowest level.

9.3 Level for volume: Start

Set the level for the known volume in this menu. If the control is set for filling, the start level is the lowest level, if it is set for emptying, this is the highest level.

9.4 Size of the volume

At this point the known volume is keyed in, between start and stop level. The resolution of the volume will reflect the measurement accuracy of the pump controller.

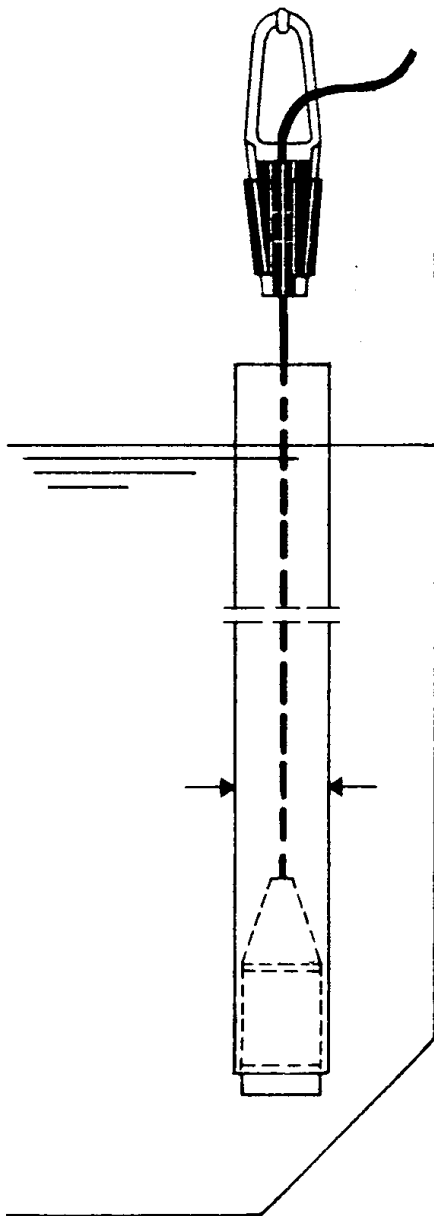
9.5 Correction factor

It is possible to adjust a correction factor. As a starting point it should be reset at 1.00. If heights or other similar uncertain factors regularly occur, the flow can be adjusted by means of control measuring.

10 Mounting

10.1 Pressure Transmitter

When measuring in a well, it is advantageous to mount the transmitter in a tube, fastening it at the top of the tube by means of the fittings supplied. This mounting facilitates subsequent cleaning and inspection.



Pressure transmitter mounted in tube

10.2 Ultrasonic Sensor

When mounting the sensor, for example, at the top of a well or a container, ensure that no pipes or cables etc. are disturbing the path between the sensor and the liquid surface. The maximum distance between the sensor and the surface must not exceed the measuring range of the transmitter. Optimum operation is obtained by placing the sensor approx. 3 ft for 30 kHz sensor, and approx. 1.7 ft for the 100 kHz sensor, above the maximum liquid level. The sensor should be positioned perpendicular to the liquid surface (*check with a spirit level!*). When installing the sensor, ensure that the signal is able to pass any obstruction, taking in consideration that signal spreads relative to the sensor/surface distance as described in the table. If the signal travels along a hard surface such as the side of a well or tank, the table values can be applied directly. Otherwise you may refer to the following mounting examples.

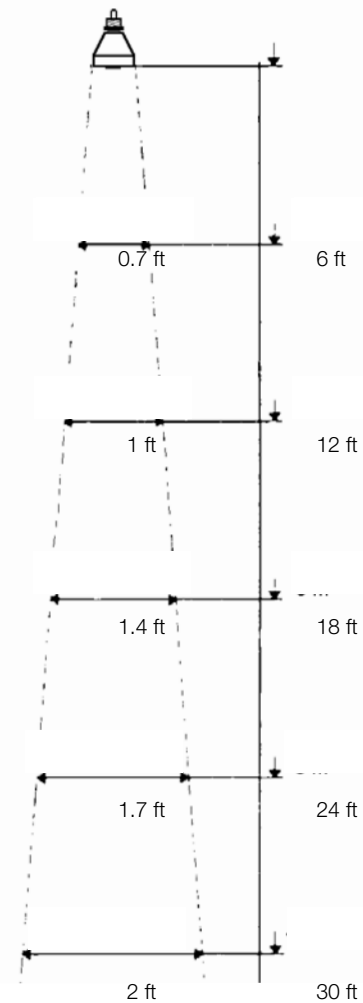
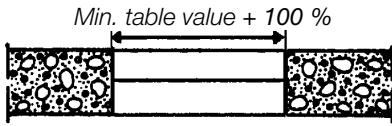
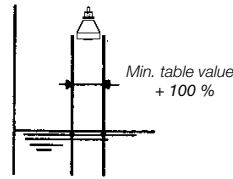
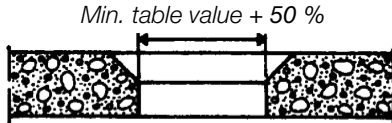


Table with the signal spread compared to the sensor/surface distance

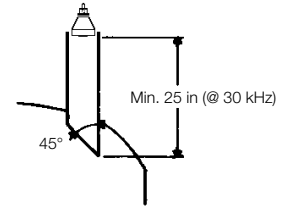
If a sensor is mounted above an obstruction ex. a concrete deck, we recommend that it should be installed as shown below:



If the upward edges on the obstruction are angled as shown below, the sensor can be mounted as the following:

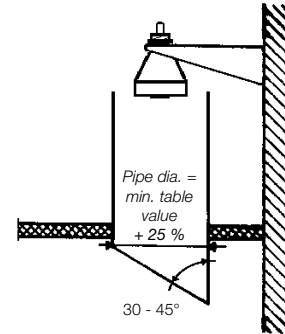


Sensor mounted in tube for scum protection.



Sensor mounted near the top of a closed container.

When measuring through a hole in for example a metal plate or grate, a pipe that ends near the lower edge of the sensor should be applied as shown here:

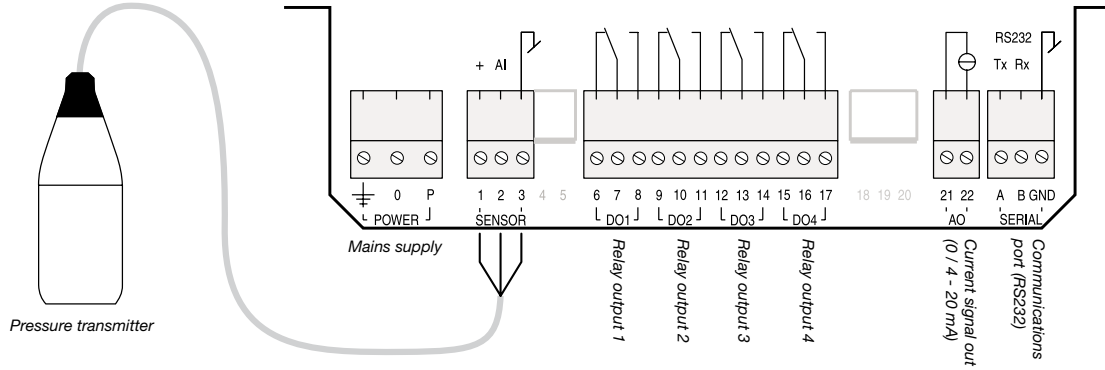


10.3 Electrical connection

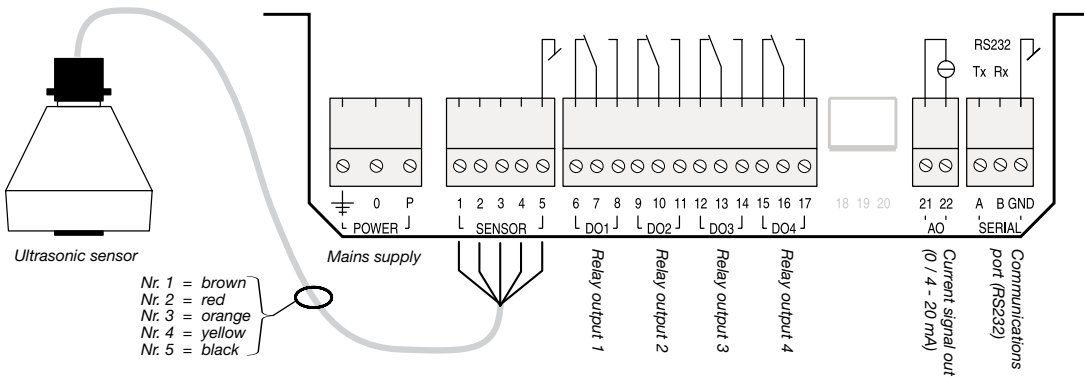
Electrical connection of the pump controller for hydrostatic and ultrasonic measuring systems respectively.

- Note: 1: Conduit hubs are to be connected to the conduit prior to the connection to the enclosure
 2: Terminal tightening torque = 0.5 Nm

10.3.1 MJK 704 with pressure transmitter



10.3.2 MJK 704 with ultrasonic transmitter

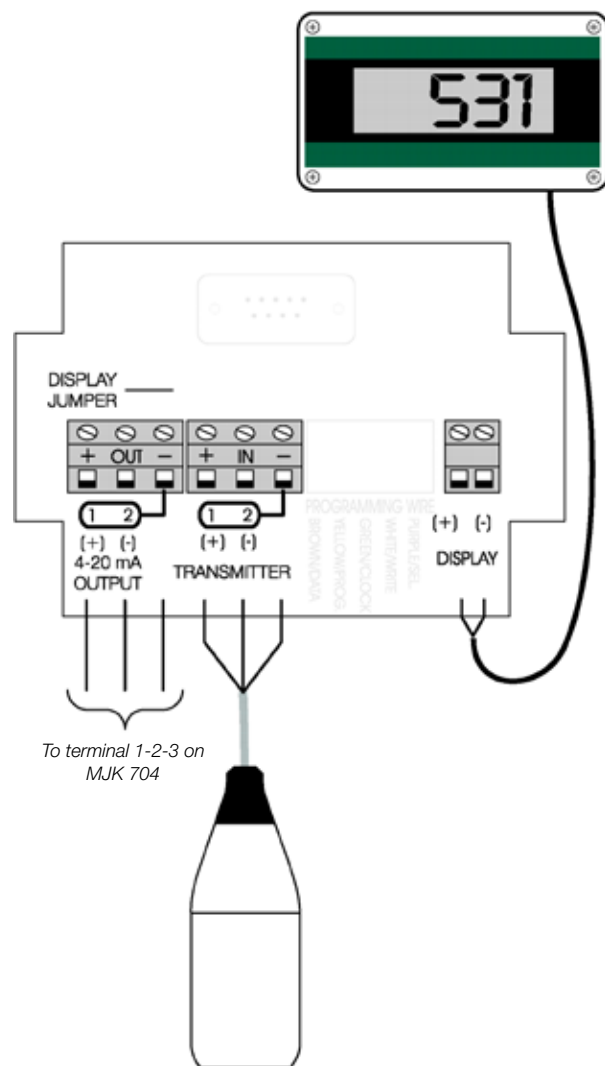


10.4 Connection box for transmitters

Connection box 202922 is used for outdoor connections of cables from the pressure transmitter. The box is made of ABS plastic, and the housing meets NEMA 6X. The box is ventilated in consideration of the tube for pressure equalizing. This allows the cable to be extended with ordinary installation cable from the box.

Connection box 200519 is used to connect the ultrasonic sensor with cable.

The connection boxes have a plug for connection of an indicator. When the indicator is applied the lid is replaced with a display.



Connection box 202922 for pressure transmitter together with a local indicator display type 531.

11 Adjustments

11.1 Level measurement

The MJK 704 Pump Controller is factory preset for level measurement with pumps or valve control.

11.2 Zero point, span and response time

The MJK 704 Pump Controller is factory preset for level measurement in water. The response time is set to minimum at delivery. When replacing the transmitter or when using the MJK 704 Pump Controller for differential level measurement or measurements in pressure or vacuum tanks, it may be necessary to reset both the zero point and the span. The resetting is carried out by simulating the zero point and the span. Depending on the use, it may also be necessary to reset the response time. If the pump controller is used in liquids with a specific gravity different from that of water (e.g. sludge), the span will need to be adjusted.

If the MJK 704 Pump Controller is used in water with foam or uncalm surfaces, it might be necessary to adjust the gain.

12 Maintenance

The pump controller and the ultrasonic sensor does not require any particular maintenance.

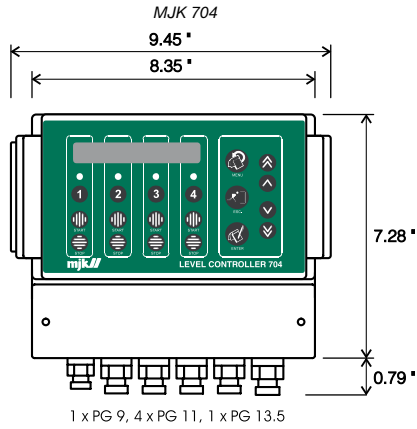
When cleaning the pressure transmitter, care must be taken not to damage the membrane.

13 Changing the software

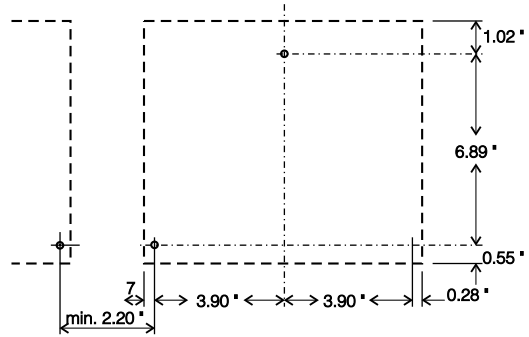
If the EPROM with the pump control software is to be replaced, you must follow these instructions:

1. Turn off the pump controller
2. Turn off all pumps, to ensure that no accidents will occur when the pump controller is turned back on. This can be accomplished by disconnecting the pumps at the terminals on the pump controller.
3. Remove the top lid
4. Remove the EPROM (IC5) from the socket, be very careful not to ruin the IC.
5. Insert the new EPROM (IC5), the notch must face upwards as shown on printboard, be very careful not to ruin the IC.
6. Mount the top lid once again.
7. Configure the new pump control program.
8. Connect the pumps again.

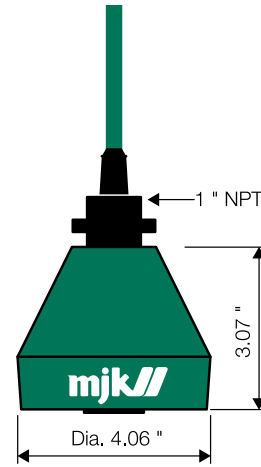
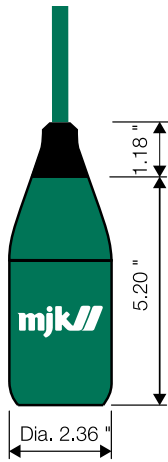
14 Dimensions



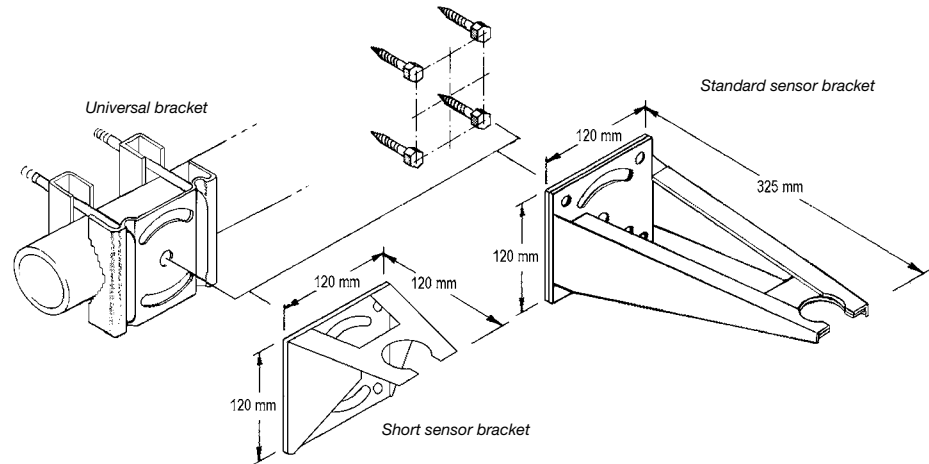
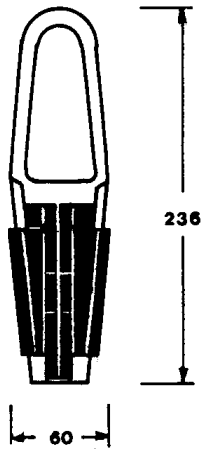
Pressure transmitter



Ultrasonic sensor



Cable bracket



15 Order numbers

MJK 704 Pump Controller without pressure transmitter

209030:	MJK 704 Pump Controller, 4 - 20 mA input
209031:	MJK 704 Pump Controller, 4 - 20 mA input with galvanically separated 4-20 mA output

MJK 704 Pump Controller with Pressure Transmitter

209035:	MJK 704 Pump Controller, range 0 - 10 ft.
209036:	MJK 704 Pump Controller, range 0 - 10 ft., with galvanically separated 4 - 20 mA output
209040:	MJK 704 Pump Controller, range 0 - 30 ft.
209041:	MJK 704 Pump Controller, range 0 - 30 ft., with galvanically separated 4 - 20 mA output

MJK 704 Pump Controller with Ultrasonic Sensor

209060:	MJK 704 Pump Controller, range 0 - 30 ft.
209061:	MJK 704 Pump Controller, range 0 - 30 ft., with galvanically separated 4 - 20 mA output

Accessories for Pump Controller

200105:	Panel mounting kit
200115:	Sun shield

Accessories for Ultrasonic Sensor

200590:	Connection box for cable for Ultrasonic sensor
200110:	Cable for ultrasonic sensor (specify cable length)
200219:	Sensor bracket, short
200220:	Sensor bracket, standard
200205:	Universal bracket

Accessories for Pressure Transmitter

202922:	Connection box for cable for pressure transmitter
202923:	Connection box for cable for pressure transmitter with programming connector
202920:	Non-standard cable lengths (+ cable per ft. in addition to standard 40 ft. cable)
200112:	Cable for pressure transmitters (specify cable length)

16 Specifications

Ultrasonic sensor

Measuring range:	6 - 30 ft
Beam frequency:	30 kHz
Spread:	3°
Temperature range:	- 5 ... + 150 °F, built-in temperature compensation
Dimensions:	dia. 4.06 in x 3.07 mm
Materials:	PP (green) / POM (black)
Cable:	Shielded, oil resistant PVC insulation, length 40 ft. (Max. length 300 ft.)
Approvals:	Ex (EEx nA II T3) and CE (EN 50081-1 / EN 500082-1)
Enclosure:	NEMA 6P, waterproof, withstands submersion (max. 3 ft.)

Pressure transmitter

Measuring ranges:	0 - 10 ft. relative pressure 0 - 30 ft. relative pressure
Output:	2-wire, 4-20 mA
Accuracy:	≤ 1 %
Temperature range:	+15 ... + 150 °F
Dimensions:	Dia. 2,36 x 5,51 in
Materials:	PP (green) / POM (black), membrane from stainless steel (AISI 316 L)
Cable:	2 x AWG 20, shielded, oil resistant PVC insulation. Length 40 ft. (Can be extenden)
Approvals:	CE (EN 50081-1 / EN 500082-1)
Kapsling:	NEMA 6P, submersible down to 100 ft.

Preslev® / Sonolev® Pump Controller:

Measuring range:	Determined by sensor
Voltage supply:	110-120 (220 - 240 / 24V AC), power consumption 10 W (approx.)
Temperature range:	- 5 ... + 150 °F
Input signal:	From Ultrasonic Sensor, Pressure Transmitter or 4 - 20 mA input signal
Accuracy:	≤ 1%
Outputs:	Analog: 0 - 20 / 4 - 20 mA, max. 500 Ω loop resistance Digital: 4 x relays with voltage free switching contacts Max. load: 250 V, 4 A resistive load, max. 100 W inductive load.
Dimensions:	Height 7.28 ", width 9.45 ", depth 4.53 "
Materials & enclosure:	Polystyrol with transparent lid, NEMA 4X
Approvals:	UL-CUL listed, file # 194021 UL 508/c22: 2 No. 142-M1987



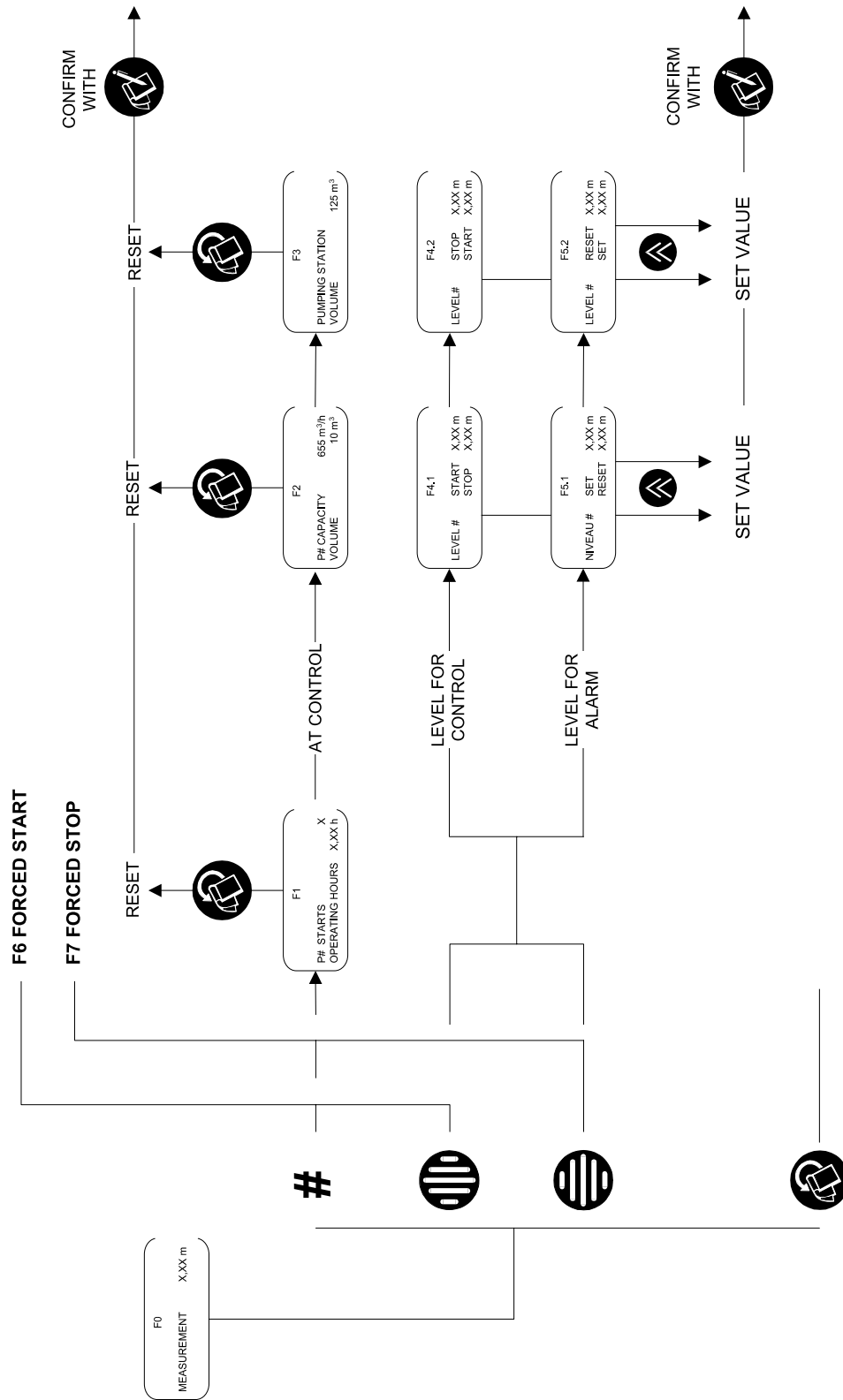
17 Settings form

Pumping Station name:		Pumping Station no.:				Date:						
		Serial no.:				Sensor no.:						
ACCESS CODE		MEASURING SYSTEM				CONTROLLER FOR						
yes	no	ultrasonic		hydrostatic		pump out	pump in					
code		level		level and altitude								
sensor and span		ALTERNATING										
select unit	m	bar	kPa	cm	mm	normal	in pairs					
select comma	1 . 234	12 . 34	123 . 4	1234								
select span												
altitude												
sensor altitude												
max. level												
sensor level (704U)												
RELAY PROGRAMMING												
in use		relay for		at control		at alternating control		at alarm		at level alarm		relay delay
yes	no	control	alarm	alter-nating	direct	level in use	level not in use	system failure	level alarm	set > reset	set < reset	
relay 1												sec.
relay 2												sec.
relay 3												sec.
relay 4												sec.
mA OUTPUT												
mA span				mA orientation								
4 - 20 mA	0 - 20 mA	0/4 - 20 mA	20 - 0/4 mA					0 / 4 mA =				
								20 mA =				
PUMPFLOW CALCULATION												
								yes		no		
level for volume – start												
level for volume – stop												
the volumes capacity												
correction factor												
START / STOP LEVELS												
				start				stop				
relay 1												
relay 2												
relay 3												
relay 4												

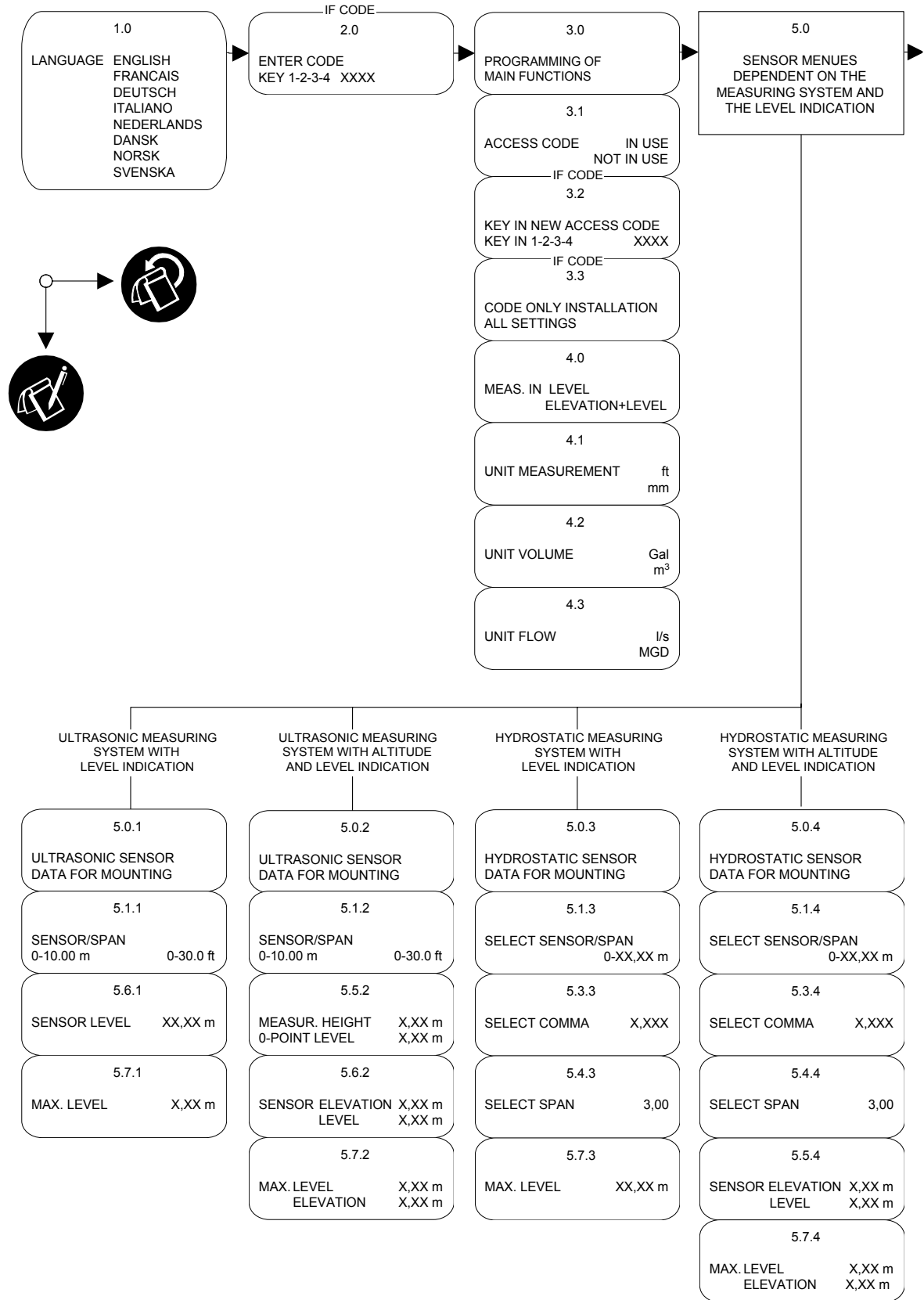


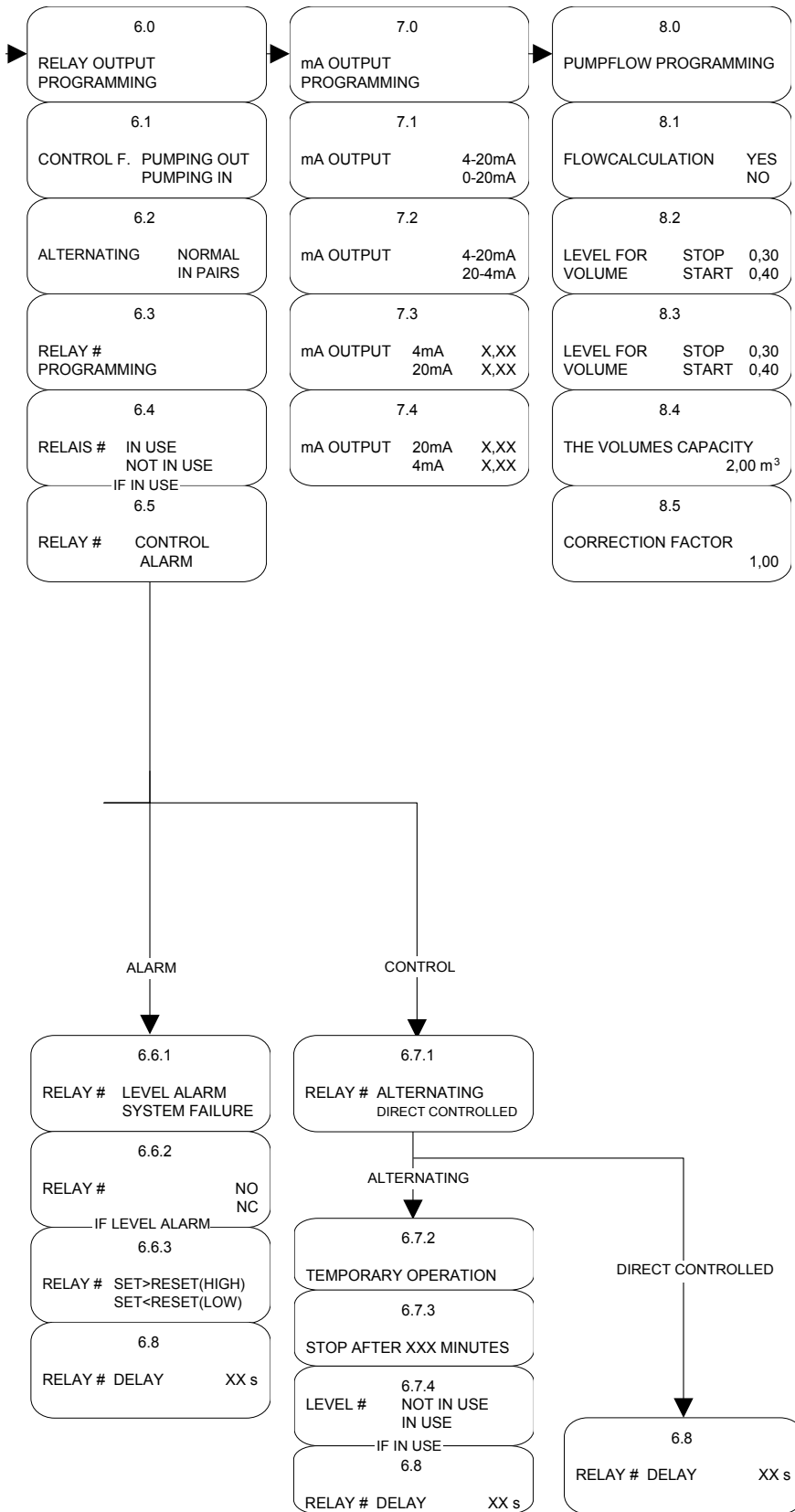
18 Operational overview

sign valid for key 1,2,3 & 4



19 Menu structure





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