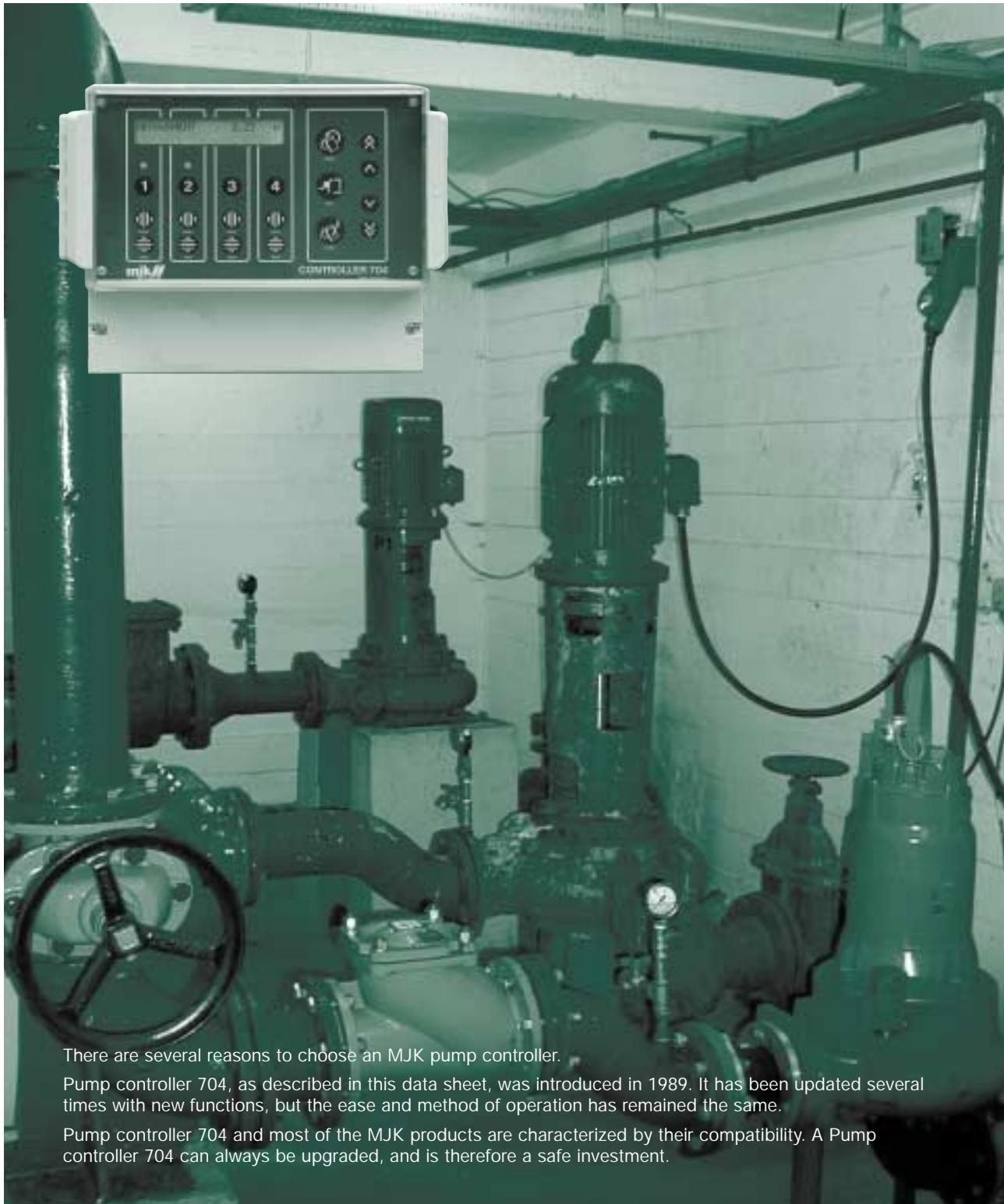


## Pump Controller 704



There are several reasons to choose an MJK pump controller.

Pump controller 704, as described in this data sheet, was introduced in 1989. It has been updated several times with new functions, but the ease and method of operation has remained the same.

Pump controller 704 and most of the MJK products are characterized by their compatibility. A Pump controller 704 can always be upgraded, and is therefore a safe investment.

## General



Pump controller 704 is a microprocessor controlled unit used with either an ultrasonic sensor or a pressure transmitter.

Pump controller 704 is designed to control up to four pumps or valves for inlet or outlet applications. Functions for control, alarm, registration, counting and flow calculating are selectable.

Pump Controller 704 is supplied with data communication capabilities so that it can be connected to a SCADA system.

## Characteristics

- Ultrasonic sensor, hydrostatic pressure transmitter or 4 - 20mA input.
- Standard measurement ranges from 0 - 3 m up to 0 - 30m in liquids, sludge.
- Measures and records level, numbers of starts, pump running time, calculates capacity and output for each pump and total for the whole pumping station.
- Measurement units in mm, cm, m, ft, inches, bar, KPa, %.

- Indication of level for use in dewatering installations or areas prone to flooding problems.
- Text display for programming and reading of measurement values with all indications in English and many other languages.
- 4 relays for control and alarms. (Or eight relays by serial connection of two 704 Pump controllers).
- Duty and stand-by pump alternation.

## Operation

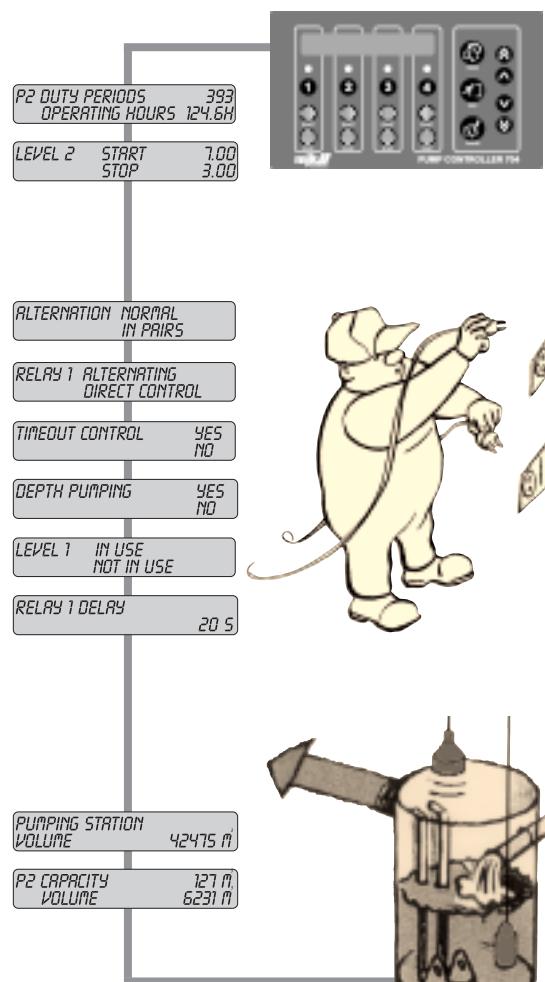
- Menu system with easy to read, logical functions.
- Start-up menu for first time operation, so that all parameters are correctly installed.
- The pump controller is operated by clearly labeled keys.
- Simplified field installation due to user friendly logical functions.
- Pumps can be manually operated directly from the pump controller.

## Operation functions

- Alternation of two to four pumps (first in first out).
- Two by two alternation of small and larger pumps.
- Alternation in sequences.
- Alternation by running hours.
- Choice of numbers of synchronous pumps in operation.
- A pumping function which allows the complete draining of a well or pumping station.
- Automatic start of back-up pump.
- Pumps can be taken out of service.
- Manual start/stop of pumps.
- Free choice of delay of start for each pump, limiting surge and start flow.
- Alarms for level and system error.
- Delays on alarm outputs.

## Flow calculation

The pump controller calculates both output and capacity of the individual pump, along with the total output of the pumping station. This MJK developed calculation model is independent of the nominal output of the pumps, and does not require keying of pumping data. This function negates the need for additional flowmeters.



## Hydrostatic measuring system

Pressure transmitter 7050 / 7060



Pressure transmitter 7070



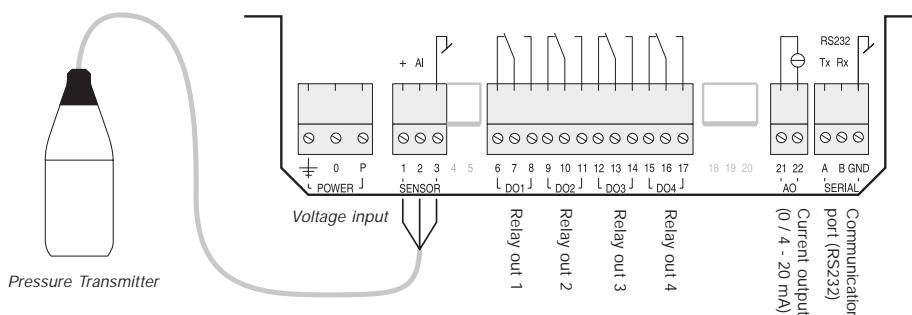
Pump controller 704P can be used for the measurement of absolute pressure with the Pressure transmitter 7050, or measurement of relative pressure with Pressure transmitter 7060/7070. These transmitters cover measuring ranges from 0-3 m and 0-30 m. Pressure transmitter 7050 and 7060 are designed for taking measurements in waste water and fluids with suspended solids, whereas Pressure transmitter 7070 is for pure water applications. Pressure transmitter 7060 can be supplied for use in hazardous areas.

## Characteristics

- Sturdy pressure transmitter with membrane manufactured from acid-proof steel.
- The transmitter uses a steel armoured cable which can withstand a tensile stress of up to 1000 Kg.
- Pressure transmitter 7050 is an absolute pressure transmitter, with electronic compensation of the atmospheric pressure, and

- no equalization tube in the cable, therefore avoiding the likelihood of condensation or freezing.
- Pressure transmitter 7060/7070 is supplied with a polyethylene equalizing tube in the cable.
- Transmitter 7050 and 7060 are designed to avoid clogging.

## Connections

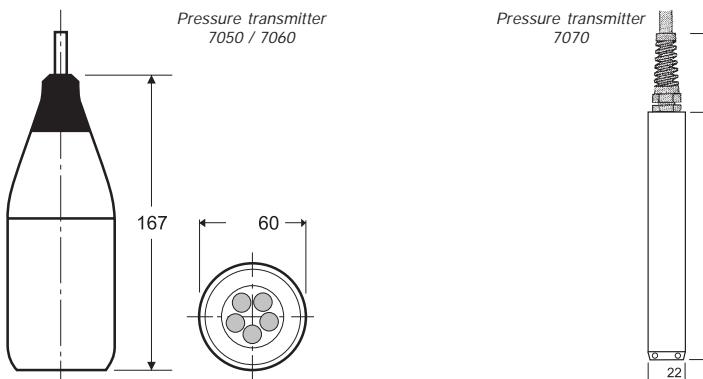


## Specifications

## Pressure transmitters type 7050-1413, 7060-1413/23/33/43, 7070-1413/23/33

Measuring ranges:	0 - 3 m: Pressure transmitter 7060-1413 / 7070-1413 (relative pressure) 0 - 5 m: Pressure transmitter 7060-1443 (relative pressure) 0 - 10 m: Pressure transmitter 7060-1423 / 7070-1423 (relative pressure) 0 - 10 m: Pressure transmitter 7050-1413 (absolute pressure) 0 - 30 m: Pressure transmitter 7060-1433 / 7070-1433 (relative pressure)
Output signal:	4-20 mA, 2-wire
Accuracy:	$\leq \pm 1\%$
Temperature range:	- 10...+ 60 °C
Materials:	Housing from PP / acid-proof steel (AISI 316 L), membrane from acid-proof steel (AISI 316 L).
Cable:	2 x 0,5 mm <sup>2</sup> , length 12 m (7060-1433 and 7070-1433: 35 m), can be extended.
Enclosure:	IP68, submersible
CE-approviale:	EN50081-1, EN50082-1
Ex-approvals:	See data sheet 2.75

## Dimensions



## Shuttle® Ultrasonic Measuring System



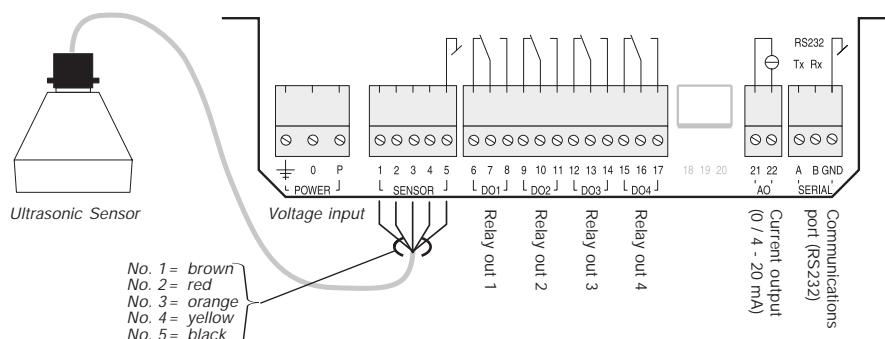
Ex

Pump controller type 704 can be supplied with the Shuttle® ultrasonic sensor, with a 0-10m measuring range. Ultrasound is a non-contact measurement system, which has the advantage that it can be used in aggressive and polluted media. With the Shuttle® ultrasonic sensor an accuracy of  $\pm 1$  cm above the measuring area will be achieved. Our system with the Shuttle® has for many years been the standard for ultrasonic pump controlling.

## Characteristics

- Non-contact measuring method, no maintenance service and no movable parts.
- 3° spread of sound system. The narrow spread of beam allows a high signal intensity and a minimum sensitivity to foam, scum and sludge on the surface.
- The sensor can withstand drowning, an important feature with storm flows.
- A Logic noise protection system ignores electrical disturbances, turbulence and even a slow moving mixer arm.

## Connections

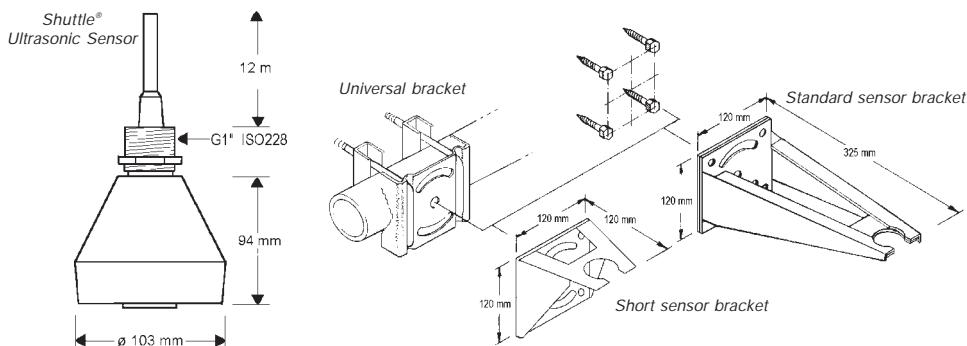


## Specifications

## Shuttle® Ultrasonic Sensor

Measuring range:	0-10 m
Frequency:	30 kHz
Spread:	3 °
Temperature range:	-20...+60 °C
Deadband:	75 cm
Materials:	PP green / POM black
Cable:	Screeened, oil-proof PVC, length 12 m (Max. length 100 m.)
Enclosure:	IP68, watertight, withstands submersion, max. 1 bar
CE-approvals:	EN50081-1, EN50082-1
Ex-approval:	Zone 2 (EEx nA II T3)

## Dimensions



**Communication**

When the 704 Pump Controller is connected through the serial port to a PC with a terminal program - or with the MJK Link™ - the following functions can be adjusted, executed and read:

- Configuration.

**Remote control and monitoring**

When the 704 Pump controller's RS232-port is connected to a 795 Data Transmitter an advanced monitoring system for remote control and monitoring becomes available.

The Data Transmitter is an advanced data logger with interface and modem that automatically communicates with the pump controller. The data logger can log in intervals from 30 seconds to 30 minutes (24 h to 100 days).

704/795 system has five analogue and twenty digital inputs/ outputs available, more than one hundred counters and hour counters plus alarm reporting. Calculated data is recorded minute by minute and with total values for today, yesterday and total.

The system can control pumps, measure and record storm flows, power failures and external functions. Data Transmitter 795 is working on public telephone network and cellular Telnet/ datanet, including internal lines and closed radio systems.

Data Transmitter 795 can communicate with:

- Standard telephones
- Fax machines
- PC's
- PLC's
- SMS- text for GSM cellular phones
- Pagers
- Data radio's in closed circuits

Data can be exchanged between most of the SCADA software available on the market, MJK Link™ and MJK Monitor™ or other 795 Data Transmitters.

One advantage of connecting Data Transmitter 795 to Pump Controller 704, is that the Pump Controller can be operated and graphically illustrated from a PC at home.

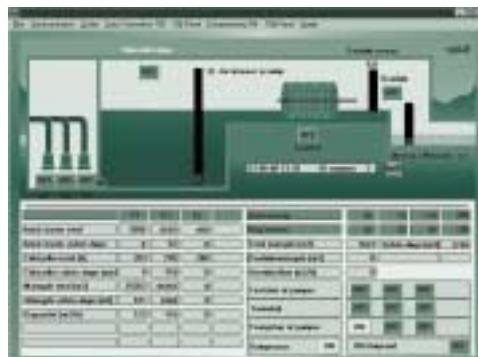
- Logging of levels.
- Start and stop levels for pumps and alarms.
- Start and stop (blocking of pumps).
- Counters and time meters.
- Calculation of volume and contents of one pump and pumping station.



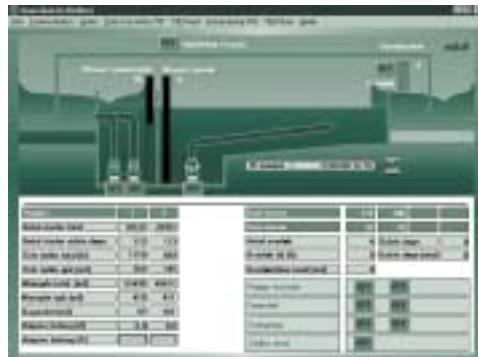
MJK 795 Data Transmitter.



From MJK-Link™: Pump station with 2 pumps and overflow.



From MJK-Link™: Pump station with drum strainer at the overflow.



From MJK-Link™: Storm basin with flushing pump and stormflow combined with a pumping station.

MJK-Link™ and MJK-Monitor™ is software developed by MJK to be used for SCADA systems.

## Specifications

## Pump Controller 704

Measuring range:	Determined by sensor
Voltage supply:	220 - 240 / 110-120 / 24V AC, consumption 10 VA (approx.)
Temperature range:	- 20 ... + 60 °C
Input signal:	From Shuttle™ Ultrasonic sensor, Pressure Transmitter or 4 - 20 mA signal
Accuracy:	≤ ±1%
Outputs:	Analog: 0 - 20 / 4 - 20 mA, max. 500 Ω loop resistance <sup>①</sup> Digital: 4 x relays with voltage free switching contacts Max. load: 250 V, 4 A resistive load, max. 100 VA inductive load.
Dimensions:	185 x 240 x 115 mm (h x w x d)
Materials & enclosure:	Polystyrol with transparent lid, IP 65
Approvals:	CE (EN50081-1, EN50082-1), cUL (UL and CSA)

<sup>①</sup> Also available in a version with galvanically isolated 4-20 mA output.

## Ordering numbers

## Pump controller with ultrasonic sensor or pressure transmitter

Measurement:	Without sensor / transmitter:	Pressure trans- mitter type 7050:	Pressure trans- mitter type 7060:	Pressure trans- mitter type 7062:	Pressure trans- mitter type 7070:	Shuttle® ultra- sonic sensor:
4-20 mA:	order no. 202030					
0-30 cm:				order no. 202055 <sup>②</sup>		
0-100 cm:				order no. 202060 <sup>②</sup>		
0-3 m:			order no. 202035		order no. 202081	
0-5 m:			order no. 202036		order no. 202082	
0-10 m:		order no. 202050	order no. 202040		order no. 202083	order no. 201040
0-30 m:			order no. 202045			

<sup>②</sup> See separate data sheet no. 2.75 for specifications on pressure transmitter type 7062

## Accessories for Pump Controller

Order no. 200105:	Panel mounting kit
Order no. 200115:	Local mounting kit with rain roof
Order no. 200055:	Galvanically isolated mA output

## Accessories for Ultrasonic Sensor

Order no. 200590:	Connection box for cable for Shuttle® Ultrasonic sensor
Order no. 200595:	Non-standard cable lengths (+ cable per metre over standard length)
Order no. 690010:	Cable for ultrasonic sensor (specify cable length)
Order no. 200220:	Sensor bracket, standard, length 300 mm from mounting plate to sensor centre
Order no. 200219:	Sensor bracket, short, length 90 mm from mounting plate to sensor centre
Order no. 200205:	Universal mounting

## Accessories for pressure transmitter

Order. no. 202922:	Connection box for cable for pressure transmitter
Order. no. 202923:	Connection box for cable for pressure transmitter with programming connector
Order. no. 200126:	Type 531 display insert for connection box
Order. no. 202920:	Non-standard cable lengths (+ cable per metre over standard length)
Order. no. 691010:	Cable for type 7050 pressure transmitters (specify cable length)
Order. no. 691014:	Cable for type 7060 pressure transmitters (specify cable length)
Order. no. 691018:	Cable for type 7070 pressure transmitters (specify cable length)

## Dimensions

