
INSTALLATION AND MAINTENANCE INSTRUCTIONS

MIXING VALVE

MX20

GENERAL

- These instructions must be carefully read before any work involving products supplied by VALSTEAM ADCA ENGINEERING S.A. is undertaken.
- The installation procedure is a critical stage in a life of the equipment and care should be taken to avoid damage to the equipment.
- Current regional safety regulations should be taken in to account and followed, while doing the installation and maintenance work.
- Handling, installation and maintenance work must be carried out by trained personnel. A supervisor must follow and check all activities.
- For the problems that cannot be solve with the help of this instructions, please contact the supplier or the manufacturer.

1. SAFETY NOTES

- This equipment is intended to be used exclusively in industrial installations, and is not prepared for use in domestic applications.
- The steam/water Adcamix mixers provide cheap, instant source of low pressure hot water by using existing steam and cold water supplies. The mixer incorporates a safety device to ensure that live steam cannot be accidentally ejected, even if for some reason the cold water supply fails. They give their maximum performance only when the equipment associated with them is correctly sized and installed in accordance with our recommendations.
- **To ensure the correct function of the safety internal device of the mixer, it should be guaranteed the correct installation of the equipment and proper maintenance according to these instruction.**
- **This equipment must not be used for heating shower water, hand wash water or any other use that requires direct contact of the hot water with body parts. This is valid for industrial and non-industrial use. If used outside of its intended use and without consideration of the present instructions, Valsteam Adca will not accept any consequential liability for the operation of the mixing valve.**
- All work must be carried out by a suitably competent person, and a supervisor must follow and check all activities. Installation and operating personnel should be trained to properly use this equipment according to this Installation and Maintenance Instructions – IMI. Where a formal “Permits to Work” system is implemented it must be complied with.
- Provisions should be taken to avoid unauthorized personnel to enter in contact with the equipment.
- This equipment is designed to work within the working temperature and pressure limit conditions stated in the nameplate and Information Sheet (IS). Check that the product is suitable for the application, to avoid failures.
- Do not remove the nameplate attached to the equipment. Serial number and other useful information are stamped on it.
- If malfunction of any other equipment or system operation failure may result in a dangerous overpressure, over temperature or even vacuum condition, a safety device must be included in the system to prevent such situations.

- The equipment is not intended to withstand external stresses that may be induced by the system to which it is being connected to. The installer should assess the risks of the stresses and possible hazardous environment around the equipment (e.g. temperature, explosion risk areas) and take adequate precautions to minimize them.
- **The complete system (before and after the equipment) should be assessed as well as the different stages of functioning (e.g. closing of some isolation valves) to ensure this will not bring additional risk to the persons and equipment.**
- Under normal operation conditions the equipment will have hot external surfaces and will contain hot fluid at a temperature higher than 70°C, it is therefore advisable to isolate all tubes and equipment to avoid the risk of burns.
- Before starting work ensure that all suitable tools and/or consumables are available. Use only genuine ADCA replacement parts.
- Do not touch the equipment without appropriate protection during working operation because it may conduct heat if the used fluid is at high temperature.
- Before starting maintenance be sure that the equipment is not pressurized or hot, even if the gauge indicates no temperature, care should be taken.
- Correct installation of the equipment is full responsibility of the contractor.

2. GENERAL INFORMATION

2.1 Description

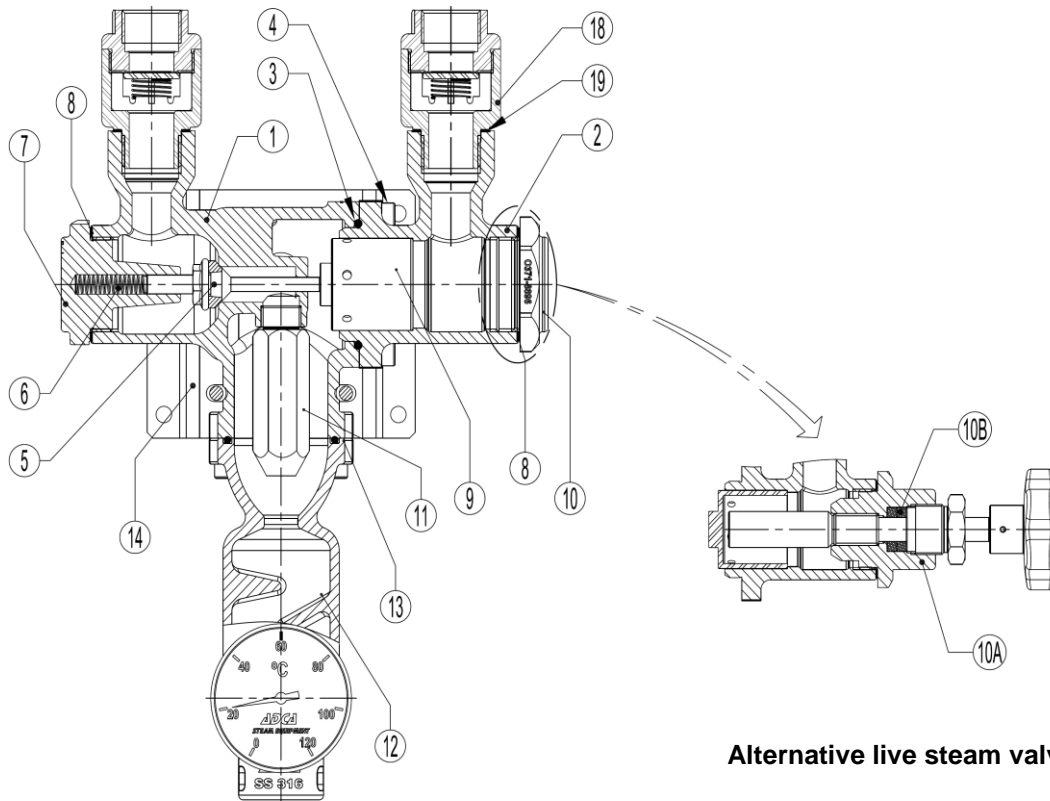
The steam/water Adcamix mixers provide cheap, instant source of low-pressure hot water by using existing steam and cold-water supplies. The mixer incorporates a safety device to ensure that live steam cannot be accidentally ejected, even if for some reason the cold-water supply fails. If live steam ejection is required, e.g. for sterilisation, an override valve can be fitted as option.

The temperature of water at the outlet of the Adcamix is easily controlled by using water and steam valves fitted to the inlets. Connections are female screwed.

FLOW RATE CAPACITY – HOT WATER FLOW (L/h)							
STEAM PRESSURE (bar)	HOT WATER OUTLET TEMPERATURE						
	40 °C	50 °C	60 °C	70 °C	80 °C	90 °C	95 °C
2,5	1900	1400	1150	900	700	650	600
3	2250	1600	1230	1030	900	800	700
4	2700	2000	1550	1250	1000	850	800
5	3250	2300	1800	1500	1250	900	850
6	3900	2900	2250	1800	1500	1200	1100
7	4200	3100	2400	1950	1600	1300	1200
8	4800	3500	2700	2100	1800	1550	1280
9	5200	3900	3000	2450	2000	1700	1600
10	5900	4100	3250	2700	2250	1900	1750

APPLICATION LIMITS	
Minimum steam pressure	2,5 bar
Maximum steam pressure	10 bar

Steam pressure equal to or no more than 3 times the water pressure.
Water pressure must not be higher than steam pressure.



Alternative live steam valve

MATERIALS		
POS. N°	DESIGNATION	MATERIAL
1	Steam body	CF8M / 1.4408
2	Water body	CF8M / 1.4408
3	* Gasket	NBR
4	Bolts	A2-70
5	* Steam valve	Stainless steel / Graphite
6	* Valve spring	AISI 302 / 1.4300
7	Steam cover	AISI 316 / 1.4401
8	* Gasket	PTFE
9	* Piston	AISI 316 / 1.4401
10	Water cover	AISI 316 / 1.4401
10A	Steam valve	AISI 316 / 1.4401
10B	* Packing	PTFE
11	Steam nozzle	AISI 316 / 1.4401
12	Mixing chamber	CF8M / 1.4408
13	* Gasket	Viton
14	Support	AISI 304 / 1.4301
18	* Check valve	AISI 316 / 1.4401
19	* Gasket	PTFE

* Available spare parts.

2.2 Function

Cold water and steam are feed through their respective check valves. As water flows inside the mixing valve it pushes a piston which in turn opens the steam valve.

Steam will then pass through the steam nozzle, mixing with the cold water by venturi effect. If the cold water supply stops, the piston will return to its original position due to the force exerted by the steam valve spring.

If the optional live steam valve is fitted on the steam/water mixer, live steam ejection is possible by overriding the cold water force on the piston.

2.3 Certification

This product has been designed for use with water and steam, which are in Group 2 of the European PED-Pressure Equipment Directive in use and it complies with those requirements.

The product falls within category SEP and must not be CE marked.

3. HANDLING



- Handling and lifting of materials should be made with adequate equipment's and following the indications of this instructions.
 - The manufacturer doesn't assume the responsibility of damaged equipment due to inappropriate handling during the transportation and storage.
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- The equipment should only be moved after draining all the fluid from inside the equipment's and pipping.
 - Equipment's should be protected from impacts and forces during transportation and storage.

4. INSTALLATION



- Account for over pressure conditions, according with the local laws or standards.
- The MX20 Mixer must not be used with other purpose than the one it was built for.
- For the problems that cannot be solve with the help of this instructions, please contact the supplier or the manufacturer.

4.1 Installation area requirements

- The installation area should have easy access and provide enough space for maintenance and removing operations.
- The installation area should have the necessary firing system to prevent damage of the equipment due to over temperature/pressure caused by fire.
- The installer should analyze the transfer of vibration to the system generated by the place where it is being installed in.
- The pipework before the mixing valve must be sized in order to avoid that the max flow speed recommended, for the fluid in question, is exceeded.
- In order to allow installation and maintenance work without emptying the system, stop valves should be installed upstream of the mixing valve in both water and steam lines.

4.2 Connection procedure

- Prior to install check that the product is suitable for the intended application: materials and pressure/temperature ratings.
- Before installing remove, plastic covers placed on flanges or connection ends. The equipment has an arrow or Inlet/Outlet designations. Be sure that it will be installed on the appropriate direction.
- Pipework connected to the equipment should be free from all stresses such as could be caused by expansion and inadequate support.
- During the assembly work, apply protective measures against dirt. Take care with jointing material to ensure that none may be permitted to block or enter the valve.
- In case of using Teflon tape (for screwed connections), avoid rolling it till the edge, because it can get cut and migrate to the valve interior, blocking or causing a defective sealing.
- The installer must check to ensure that there are no foreign bodies inside the pipes, and that the piping where the equipment will be connected also does not contain any foreign bodies.
- The MX20 must be installed in a vertical position with the hot water outlet connection at the bottom to ensure that the best results are obtained.
- **Steam pressure should be equal to or no more than 3 times the water pressure. Water pressure must not be higher than steam pressure, to ensure a correct function and a safe use.**
- It is recommended that pressure gauges are fitted in both the steam and cold-water supply to ensure the previous relation of water – steam pressure during all the time of operation and also to support on troubleshooting.
- To automatically remove condensate from line thus eliminating water hammer when the MX20 is first put into use or after long periods of inactivity, an ADCA steam trap must be installed in the piping immediately ahead of steam valve (see typical installation). Condensate shall be connected to the condensate recovery system.
- An ADCA pipeline strainer should be installed upstream of the mixing valve on both water and steam lines to protect from dirt which could damage the valve or cause mal-functioning. The strainer must be installed with the sieve sideways, if the medium is steam, to prevent the collection of condensate.
- External stresses that may be induced by the system due to pipe expansion, etc, can affect this product. The necessary precautions are recommended during the systems design and equipment assembly.
- The mixing valve pipework should be properly supported and free from strain and it should not be subjected to undue surges of pressure. The start-up condition should be considered.

5. START UP



ATTENTION

- Current regional safety regulations should be taken in to account and followed.
- Protective insulation and warning notices may be required.
- Until the start up of an existing or a new plant, the following must be checked:
 - All works are completed.
 - The equipment is correctly installed.
 - All the necessary safety devices have been installed.
- At start up, the presence of small particles in the motive fluid (dirt, scale, weld splatters, joint particles, remains of Teflon tape, etc) may cause an imperfect closure of the valve. If this occurs, proceed to an accurate cleaning.
- Protection varnishes from pipes and flanges, fats, leftover paint, graphite, etc, should also be carefully clean, because they can be dissolved in the fluids (like steam) blocking the regulation elements after the first service stop.
- **A safety check should be undertaken by qualified personnel, prior to every use, according to the instructions of periodical checking.**

5.1 Start-up procedure

- Ensure that the MX20 mixer main steam and water isolation valve is closed.
- Open slowly the water upstream stop valve, in order to avoid water hammer damaging till you have the desired flow rate.
- Open slowly the steam upstream stop valve, and at the same time check the temperature rise in the temperature indicator. Stop opening the valve when the desired temperature is reached.
- The hot water is ready to use.
- Do not point the gun directly to body parts, since it can generate water at very high temperatures that can cause severe burns.
- Check operation of steam traps (if fitted) and ensure that there is no leakage on any of the main connections of steam and water. If so, proceed to readjust.
- Read the shut down instructions for details on depressurization.

5.2 Periodical checking:

- 24 hours after the start up, it is recommended to check pipe connections for leaks and retighten the connections if necessary.
- Re-check operation of steam traps.
- **A safety check should be undertaken by qualified personnel, prior to every use. The safety check should include a steam detection test, described on the “Safety device testing”.**

6. STORAGE AND SHUTDOWN

If the equipment will be shut off for a large period of time, care should be taken to avoid exposure to low critical temperatures. It should also be isolated from dust accumulation.

6.1 Shut down procedure

- The shutdown should be performed in the reverse way as indicated on the start-up.
- After close the main valves of water and steam, it should be discharged the remain contents of the hose by pulling the gun trigger and eliminate pressure until water flow stops.
- If the system will be shut off during a large period of time it's recommended to completely drain all the condensate and water from the system.

7. MAINTENANCE



- Before executing any maintenance, work read the the "Safety notes" in section 1
- The ADCAMIX MX20 steam - water mixers do not require any particular maintenance.
- A correct operation of the steam/water mixer will only occur if the piston and steam valve stem move freely. Scale will seize these parts, thus the valve should be maintained and cleaned regularly to prevent scale accumulation.
- When reassembling makes sure that all gasket faces are clean and always use a new gasket. Tighten the bolts uniformly in a diagonal sequence.
- Before starting maintenance be sure that the equipment is not pressurized or hot. Even if upstream and downstream isolating valves have been closed care should be taken.
- Strainers should be cleaned.
- Pour quality water or corrosive fluids will compromise the lifetime of the equipment's and can lead to premature failure. We recommend an appropriate inspection at least yearly depending on the presence corrosion conditions.
- Precautions should be taken to avoid the entrance of foreign bodies during maintenance service.

7.1 Maintenance procedure

- Follow the shutdown procedure described on these instructions.
- Remove the equipment's to assess.
- Execute the maintenance work. Examine steam valve nr.5 and seat to ascertain the extend of any damage or service wear. If necessary, replace valve and spring nr.5 and 6 and clean piston nr.9.
- Perform the cleaning of the internals parts to ensure correct functioning of the seat/piston.
- Reinstall the equipment's on the correct positions, confirming the fluid directions on the drawing (Don't forget to replace the gasket and PTFE seals where applicable).
- Follow the start-up procedure.

7.2 Safety device testing

The safety devices should be tested regularly to ensure its correct operation. Current regional safety regulation should be taken into account and followed. These tests can only be performed by qualified personnel.

7.2.1 Steam safe device

Adopt a firm body position that can hold the steam jet force, and use protective clothing, especially heavy-duty gloves and safety glasses. Point the gun to a non-dangerous position, to ensure safety of personnel and equipment's. With the cold-water inlet valve shut off and the steam inlet valve open, carefully operate the gun.

There should be no flow observed at the gun. If steam flow is detected during the test, measures should be taken to inactivate the equipment and guarantee it is not re-used until ensuring its correct functionality.

Some common faults and possible solutions are described in the section "Troubleshooting" of this IMI, if these do not help in resolving the issue contact the factory for technical support.

7.2.2 Attached devices (gun and hose)

It should be granted a visual inspection of the hose and gun assemblies on a daily basis before each utilization, to ensure that it has no signs of wear or breaks in the external surface of the hose. If any abnormality is detected, inactivate the system until the replacement takes place. The hoses should be replaced after 12 months service, due to normal degradation of rubber.

TROUBLESHOOTING

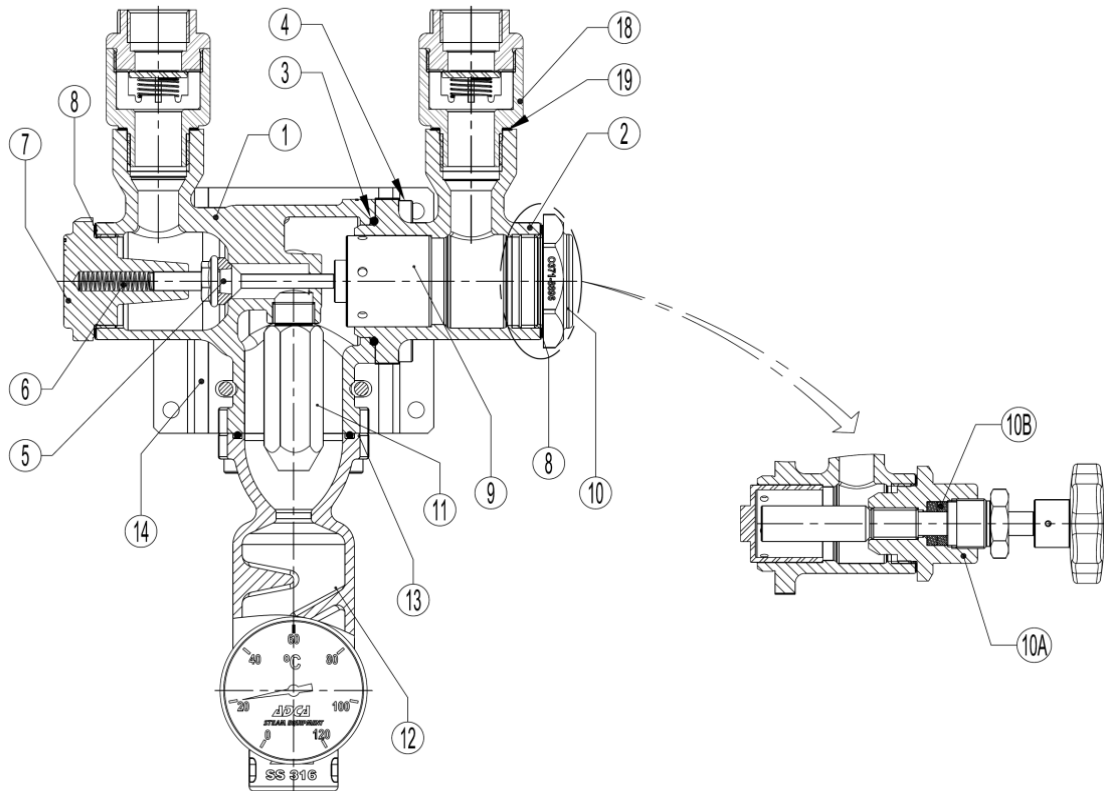


- If the malfunctions cannot be solved with the help of the following chart, please consult the manufacturer.

TROUBLE SHOOTING CHART		
FAULT	POSSIBLE REASON	SOLUTION
Water doesn't heat	High water flow rate	Slowly close the water inlet valve till the desired temperature is reached.
	Low flow rate of steam	If available, increase the steam flow rate by opening the steam valve while observing the temperature indicator, till the desired temperature is reached.
	Obstruction of the mixing valve	Proceed to an accurate cleaning of the mixing valve internals and the strainers screen.
Noises and vibrations on the steam pipe work	Water hammer	Check if the steam traps are working properly. If not, proceed to maintenance. If they have insufficient capacity, consider the possibility to install more steam traps or others with higher capacities.
Noises and vibrations on the water pipe work	Deficient closure of the piston on the mixing valve	Dirt could be blocking the closure of the piston. Proceed to an accurate cleaning of the internal parts.

SPARE PARTS

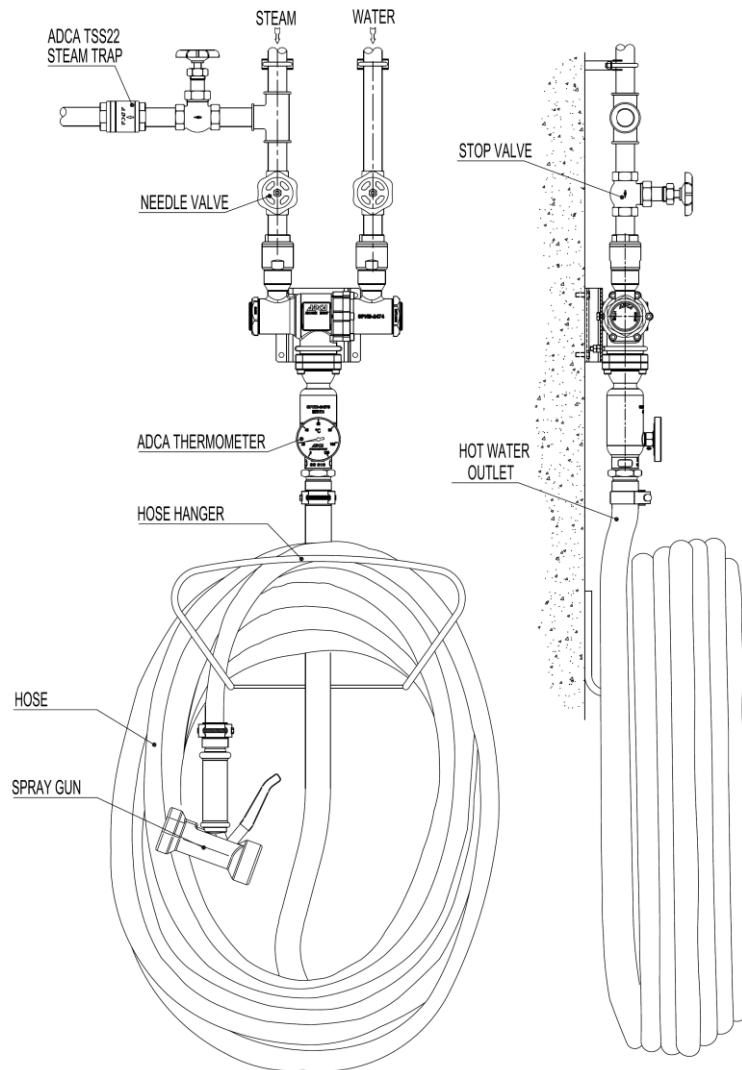
ADCA MX20				
CODE	DESIGNATION	VALVE SIZE	POS. N°	QTY.
A.95.7050.020	Valve, spring & gasket	3/4"	5, 6, 8	1
A.95.7050.120	Piston & gasket	3/4"	9	1
A.95.7050.220	Check valve	3/4"	18, 19	2
A.95.7050.420	Packing & gasket	3/4"	8, 10B	1



RECOMMENDED TIGHTENING TORQUES		
POS. N°	SIZE	Nm
7, 10	3/4"	80

Remarks: Tighten cover bolts uniformly.

ADCAMIX Typical Installation



8. DISPOSAL

Once the unit has reached the end of their working life, it should be sent for disposal in accordance with the prevailing national and local regulations.

During its disposal, pay special attention to the rubbers, resins and polymers used in its construction (PVC, PTFE, PP, PVDF, Viton, etc.).

For further information, please contact Valsteam ADCA Engineering SA.

9. PRODUCTS RETURNING



ATTENTION

- Information regarding any hazards and precautions to be considered because of contaminating fluids and residues or mechanical damage that may represent a health, safety or environmental risk, must be provided in writing by the distributors and costumers when returning products to Valsteam ADCA engineering.
- Health and safety data sheets regarding substances identified as hazardous or potentially hazardous must be provided with the information mention above.



ATTENTION

- **LOSS OF WARRANTY:** Total or partial disregard of above instructions involves loss of any right to warranty.