

**MSL TYPE DISPLACEMENT LIQUID FOAM PROPORTIONING UNITS FOR
VARIABLE FLOWRATE - WITH VERTICAL TANK AND TOP+BOTTOM FIXED
MEMBRANE**

OPERATING AND MAINTENANCE HANDBOOK

1 INTRODUCTION

The displacement liquid premixer MSL type is an equipment designed to operate in the fire fighting field as a water and foam compound mixing unit.

Pressurized water is applied to mix water and foam liquid in the necessary percentage.

In fact, the water pressure in the feeding lines flows off the foam compound stored in the tank.

The premixer body consists in a Venturi proportioner designed to mix the foam compound at a certain percentage whatever the water flowrate may be.

Fixed on the upper and down parts of the tank, a synthetic membrane (hypalon) is provided to separate water from foam compound.

The unit is complete of all necessary valves, fittings and level and pressure controls.

The main design data are indicated in the enclosed data sheet.

2 TECHNICAL FEATURES

The displacement liquid premixer is supplied pre-assembled, provided of all the necessary accessories having the following functions (for your easy reference, see diagram on the last page):

- 1) tank for foam storage,
- 2) ball valve for level indicator
- 3) drainage valve for membrane (normally closed)¹
- 4) valve for drainage/feeding the tank
- 5) vent valve for the tank
- 6) membrane for the two liquid (water/foam)
- 7) vent valve for the membrane
- 8) premixer pipe
- 9) pressure indicators for premixer pipe: inlet and outlet pressure to the Venturi pipe
- 10) valve for pressure indicator
- 11) drainage valve for Venturi pipe
- 12) inlet water line
- 13) inlet water valve to the tank
- 14) pressure indicator for the tank
- 15) valve for pressure indicator
- 16) safety valve
- 17) outlet foam line
- 18) outlet foam valve from the tank
- 19) check valve outlet foam line
- 20) pressure indicator
- 21) valve for pressure indicator

¹ This valve must be kept closed during working condition, except for "maintenance and repair operations".

- 22) tank identification plate
- 23) manhole
- 24) foam feeding valve from pump
- 25) drainage for washing pump
- 26) manual pump
- 27) electro pump

3 INSTALLATION

To install the unit follow usual rules for pressurized tanks.

Be careful to lift the unit utilizing suitable eyebolts.

The tank has to be anchored to its basement through suitable fixing screws.

Once installed and having checked the Venturi position, connect the inlet/outlet Venturi pipe with the main water network and the foam compound distribution pipe.

Both network and pipe must be provided with necessary control valves.

NOTE: Above the top flange of the vessel, remind to leave a free gap equal to the vessel hight. The gap is necessary for maintenance operations.

4 PREMIXER COMMISSIONING

Scope

For the first foam tank filling, use a manual pump or an electro pump with a flow rate about 100-200 lt/min with a low head (20-30 mt).

4.1 Foam filling with external pump

- A) after the connection of the pump to the feeding valve (4) check the valves (2) (11) (13) (18) (24) (25) are closed.
- B) open the vent valve for the tank (5); open the vent/drainage valve for the membrane (7); open the drainage valve for the membrane (3)
- C) open the feeding valve (4); operate slowly with the charging pump and if all works properly, go on with the filling
- D) during the charging operation check the valve (7) if air or water flows and check the level by the ball valve (2)
- E) the filling is completed when from valve (5) the foam liquid flows out with a full jet. For this reason it is suggested to connect a ricicle with a flexible pipe from the valve (5) to the foam drum.
- F) close the valves (5) (7) (4). The foam displacement liquid premixer is ready for its use

4.2 Foam filling with its pump

- A) connect the pump (25) o (26) to the foam barel,
- B) check the valves as per point 4.1 A
- C) open the valves (5), (7), (3),
- D) open the valve (24) and operate with the pump; follow the point 4.1 D and E,
- E) close the valves (5), (7), (24), (3),
- F) wash the pump (26) o (27) by the valve (25)

5 WORKING OPERATIONS

- A) open the inlet water valve (13)
- B) open the outlet foam valve (18)

6 OPERATIONS AFTER USE

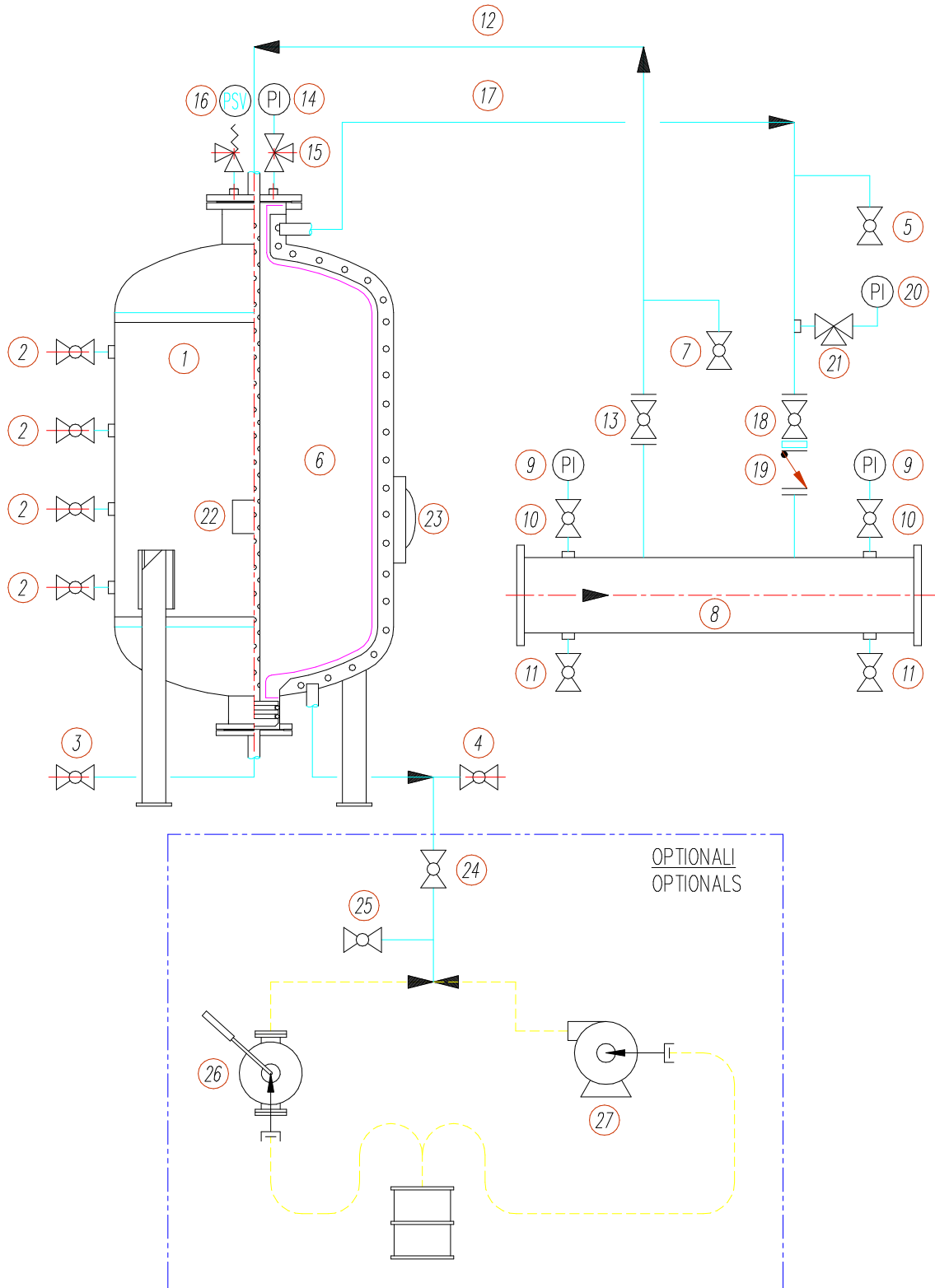
- A) close the valve (13)
- B) close the valve (18)
- C) filling the tank as per points 4.1 / 4.2

7 MAINTENANCE / REPAIR

- A) periodically check (at least once a month) the foam level by the ball valves (2).
- B) during the foam filling verify the status of the membrane. Check if foam liquid flows from valve (7). In this case the membrane must be repaired or replaced.

- Membrane replaced

- Discharge completely the foam liquid in the tank by valve (5), (4), (7) and (13).
- Remove the membrane (6) from the upper part opening the flange. The vertical space required for this operation must be, at least, the height of the group.
During the replacement of the membrane in the tank, take care of it while the internal pipe is connected to the bottom part of the tank. This operation must be checked through the manhole.
- Start the filling as per points 4.1/4.2.



(1.98)