



## Reverse Osmosis System

# G1 Series RO

### TECHNICAL DATA SHEET



M009-67 – Rev. 00 – 10/2014

Culligan® G1 Series reverse osmosis systems are the result of Culligan's long experience in applications of membranes on a world level. From water treatment for commercial applications of various sizes to that for the whole town water supply, Culligan has the expertise and a range of products to meet any need.

The G1 Series reverse osmosis system is ideal for small and medium size applications that require high quality osmosed water. The system was designed and developed in order to meet various treatment requirements, from 0.6 to 5.8 liters per minute (from ~860 to ~8350 liters per day). The system can be easily wall mounted, or floor mounted using a special optional support.

A range of standard functions aided by specific accessories can meet any application. To have a complete system, just choose the right size and the auxiliary accessories.

#### Key product features

- Simple integration of the system
- Flexible configurations
- Prompt delivery/Easy installation
- Exclusive cutting-edge Culligan electronics
- Multi-language option
- Operating data chronology
- Alarm recognition
- Values in metric and imperial units of measure
- Remote monitoring options for connections to a PLC system
- Telemetry options for remote alarm
- TDS probe: the TDS probe measures the quality of the desalinated water.
- Remote alarm output connection (optional): provides a dry NO or NC contact. This feature can be used to activate an alarm or programmed in an alarm management system (DCS).

The G1 Series is a reverse osmosis (RO) system which, desalinating more or less brackish water, is also suitable for drinking water and technological use.

The system does not include any pretreatment except a cartridge filter with 5 $\mu$  filtration to protect the RO membranes. This pretreatment will be suggested according to the end chemical characteristics of the treated water. The system is designed for wall mounting, but can be placed on the floor using an optional kit. M1 Series desalters are supplied in the following configuration:

- 1 box containing preassembled motor panel, brackets for wall mounting, hose for interconnections and 5 $\mu$  cartridge filter.
- Pressure vessels according to the chosen model
- Osmosis membranes according to the chosen model
- Kit of fittings for interconnection between the pressure vessel and main panel

Optional devices:

- Rigid stand for floor installation,
- Kit for product under pressure with possibility of adding expansion vessels of different volumes.
- Telemetry modem
- Reverse osmosis remote monitor
- Cable from GBE to USB kit
- Cable from GBE to RS232
- Cable from GBE to RS485
- Cable from GBE to Modbus
- Alarm relay board
- Steel floor column
- Pressurized products kit
- Pressurized tanks in various sizes

## **Main features of the GBE electronic controller**

### **The system calculates the normalized flow rate**

The system calculates the normalized flow rate and can be configured to activate an alarm if the normalized flow rate drops below the specified limit.

### **Diagnostics and activation mode**

The system can be configured to go into standby mode or to automatically resume producing osmosed water in case of a power loss and reinstatement. In case of a power failure, when the power is restored the system returns to the operational phase via self-diagnosis, without the need for manual intervention.

### **Smart control of storage tank and pressure**

The system controls the stand-by or operation modes, receiving consent from the minimum and maximum level switches in an atmospheric storage tank, or a pressure switch.

### **Pretreatment stop**

This feature allows communication with the pretreatment (filter or water softener) for which it is possible to activate a regeneration or backwash cycle during periods of low water consumption, putting the RO system in standby mode. The desalinated water tank must be correctly sized according to the continuous demand for desalinated water.

### **GBE controller chronological data**

The GBE controller stores the system operation data in order to help optimize performance and determine when the RO membranes have to be cleaned or changed.

### **Target TDS**

When operating, the RO system calculates the average total dissolved solids (TDS) in the desalinated water, mixing low quality water and desalinated water. Using this function the system is able to mix raw water and osmosed water until the conductivity value set by the user.

### **Communication via modem**

To remotely check the operation of the RO system, an optional modem and a monitoring service can be used. This service can also be used to inform the customer and the Culligan dealer in case of an error or alarm condition.

### Wireless remote control communication

The optional wireless remote control can display the current operating status and operation statistics up to 65 m. from the G1 RO system.

### Outputs for programmable logic controller (PLC)

The GBE controller collects data every minute and sends it to the customer's PLC, for the purpose of collection or control of the data. For more information, refer to the Culligan advanced communication manual. This data can be easily imported into a spreadsheet in Excel; graphs and trends can then be created using the recorded data.

## INSTRUCTIONS

- Refer to the technical manual supplied with the system for all information and instructions.
- All handling, installation, maintenance or repair work on the systems must be carried out by qualified personnel, in compliance with Min. Decree 37/08, the best state of the art and according to that given in the technical manual.
- The place where the systems are located, the accessory material and consumable products must comply with the current regulations on storage, use and safety.
- The water produced by each device must only be used for its specifically intended purpose. Culligan declines any liability for the consequences of improper use of the water produced by its equipment.
- Any anomaly in the operation of the systems must be promptly reported to the Culligan Service Center. Culligan declines any liability for the consequences of prolonged use of a clearly faulty system.
- Where necessary, the selection, dosage and handling of chemicals must be done by qualified personnel, in compliance with Culligan instructions and the Safety Data Sheets.
- Culligan also declines any liability in the following specific cases:
  - improper use of the device;
  - use contrary to the specific national regulations (power and water supplies, installation and maintenance);
  - installation done without following the instructions provided in this manual;
  - power and water supply faults (electrical discharges – voltage rushes – water supply overpressure – low water pressure);
  - unsuitable ambient operating temperature;
  - inadequate maintenance;
  - unauthorized work or modifications;
  - use of non-original replacement parts or not specific for the model;
  - total or partial non-compliance with the instructions;
  - For that not expressly specified, the operator must use common sense when using the device.

## OPERATING LIMITS

The water to be treated must meet the following main characteristics (for the other parameters, not considered here, it is assumed that the water has characteristics suitable for drinking). If unsuitable chemical-physical and microbiological parameters are detected in the raw water, Culligan will suggest the best pretreatment, in order to meet the performance requirements.

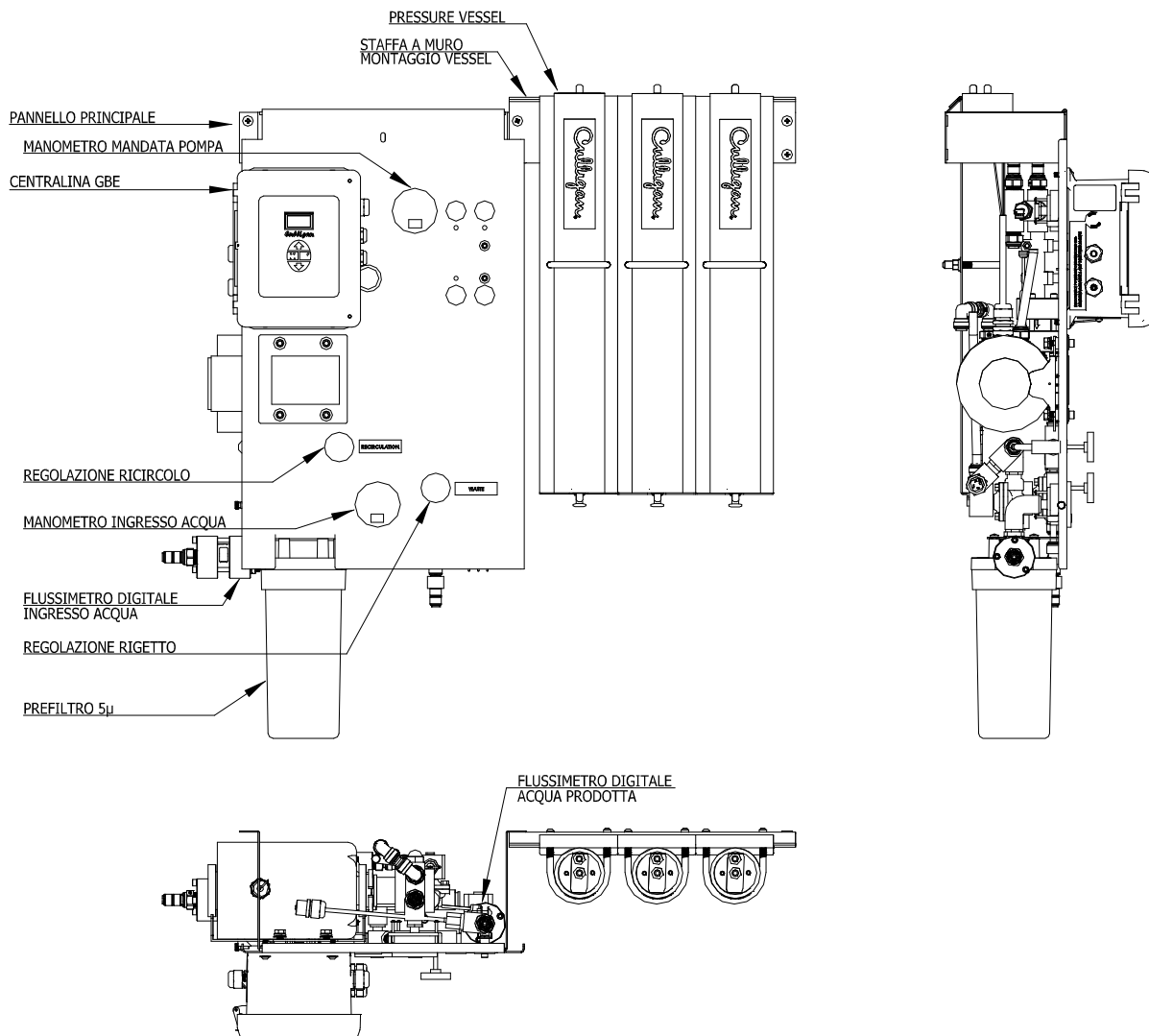
Dynamic inlet pressure (min-max)	1.4 – 3.5 bar
Operating pressure (min-max)	6.6 – 10.5 bar
Power	
Voltage	220 V
Frequency	50 Hz
Phase	1
Feed water temperature	1-38° C
pH range	6 – 11
Chlorine	Absent

Max. salinity.	< 2500 mg/l
SDI (colloidal density index)	< 3
Iron, Manganese	Absent
Salt rejection, nominal	> 98 %
Product water hardness	< 1% natural hardness

## INSTALLATION

The desalter must be installed by qualified personnel, in compliance with Min. Decree 37/08, the best state of the art and according to that given in the technical manual.

## INSTALLATION DIAGRAM



**Note:** The figure shows the G1-3S model with 21" vessel

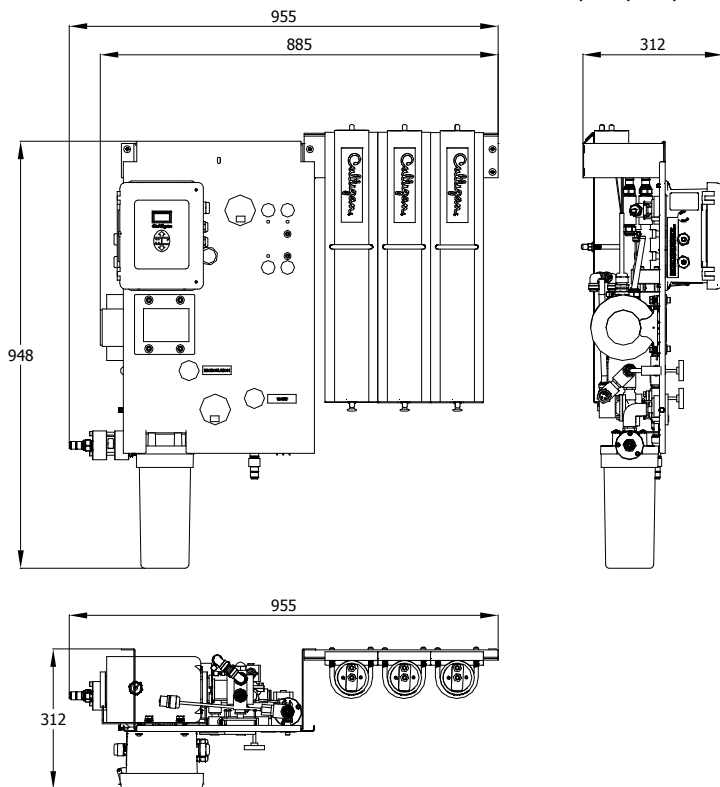
## TECHNICAL SPECIFICATIONS

	G1-2S	G1-3S	G1-2L	G1-3L	G1-4L
Nominal capacity, l/hr*	80	120	190	270	350
Operating weight, kg	37	42	40	47	49
Unit connections					
Inlet (pipe) - mm	10				
Demineralized water (pipe) - mm	10				
Concentrate (pipe) - mm	10				
Electrical specifications					
Motor power, kW	0.25		0.56		
Power requirements (Vac/phase/Hz)	230/1/50				
Full load current, amps (at 230 V)	4		6		
Prefilter					
Qty housing	1				
Cartridge filtration degree,	5 micron				
RO					
Qty vessels	2	3	2	3	4
Qty membranes	2	3	2	3	4
RO element dimensions - in	2.5x21		2.5x40		
RO array	1:01	1:01:01	1:01	1:01:01	1:01
Demineralized water flow rate l/h *	76.8	118.2	188.4	268.2	347.4
Concentrate flow rate - l/h	76.8	118.2	188.4	268.2	347.4
Required inlet feed flow rate - l/h	159	236.4	376.8	535.8	694.8
Pump delivery at 150 psi, l/h	318		590		704
Module max. feed pressure - ma - bar [kPa]	10.3 [1034]				
Module nominal feed pressure – bar [kPa] **	6.9 [689]	7.1 [709.7]	6.6 [661.4]	6.7 [668.3]	6.9 [695.9]
Max. demineralized water pressure - bar [kPa]	2.75 [275.6]				
Min. inlet dynamic pressure – bar [kPa]	1.37 [137.8]				
Max. dynamic pressure - bar [kPa]	3.5 [344.5]				
Operating temperature °C	1-38				
Recovery (%)*					
Nominal	50				
Minimum	40				
Nominal salt rejection (%)	98				

\*\* Measured using a fouling factor equal to 0.85

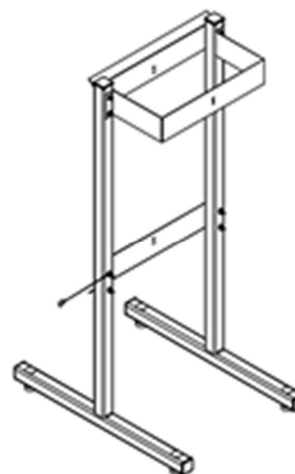
\* Nominal capacity based on new osmosis membranes working with properly pretreated feed water with 500 ppm TDS such as NaCl, at 25°C, with index of concentration of particles suspended in water (SDI) below 3, and delivery of water at atmospheric pressure. Productivity varies according to the temperature and the actual quality of the feed water.

## OVERALL DIMENSIONS G1 Series models 2S, 3S, 2L, 3L



### Rigid stand for floor installation

Dimensions in mm : 610x430xH1085



## OVERALL DIMENSIONS G1 Series 4L

