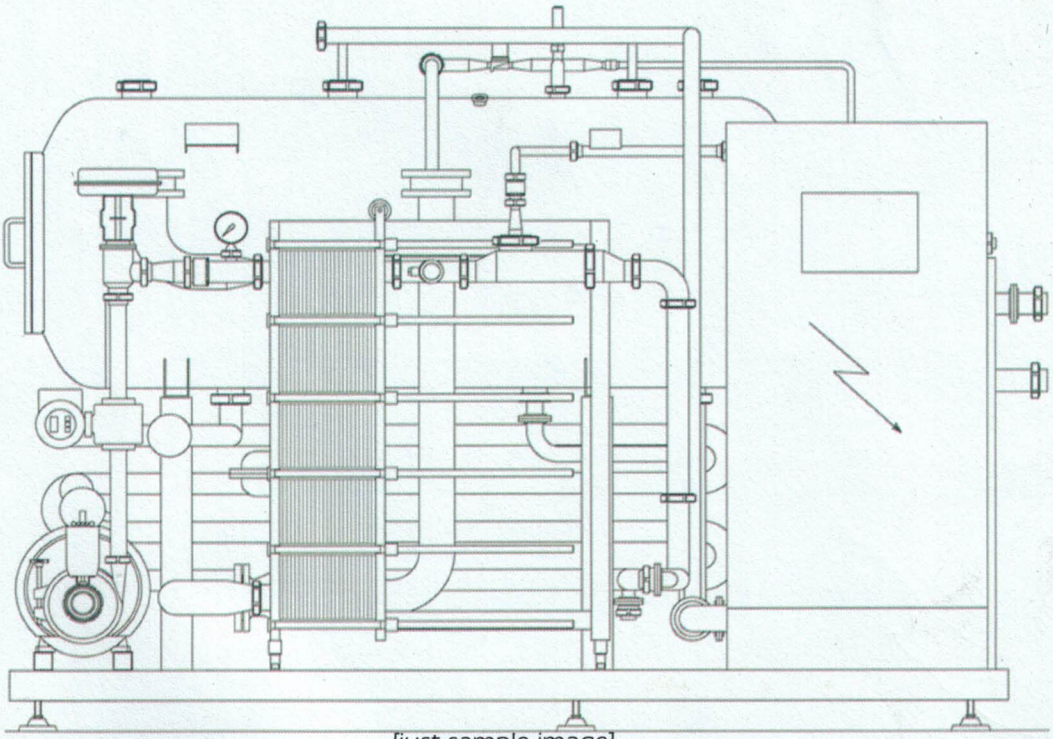
Use and Maintenance Manual

CARBONATION UNIT 20HL/H



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CE

VERSION 1.0
EDITION JANUARY 2018

1.3.0 CONDITIONS FOR USE

1.3.1 EXPECTED USE

The Carbonation unit to which this manual refers, has been designed for adding CO_2 to the beer/wine.
This system is arranged to perform the complete cycle and the delivery of the finished product to a bottling-machine.

Attention!: **Appropriate cleaning should be performed after use**
see "Chemical washing" on page 55.



1.3.2 UNEXPECTED USE

Attention!: **It is forbidden to perform the treatment of any non food liquid.**



TECHNICAL DATA SHEET

2.0.1 PLANT IDENTIFICATION DATA

Plant type	Carbonation unit 20 hl/H
Serial Number	91349911-0/001
Year supplied	2018
Electric voltage	400V/50Hz
Absorbed power	4 kW
Absorbed current	7 A

Table 1: Plant data

2.0.2 TECHNICAL DATA

Plant dimensions		Carbonation unit
Length	m	2.000
Width	m	1.200
Maximum height	m	1.700
Machine weight	Kg	300
Total weight (with plant full)	Kg	600
Package weight (crate and/or pallet)	Kg	40

Table 2: Technical data

2.0.3 NOISE LEVEL

Equivalent acoustic radiation pressure level (Leq)	dB(A)	80

Table 3: Noise level

2.0.4 TECHNOLOGICAL DATA

- Flow rate: beer/wine	l/h	2,000
- Inlet temperature:	°C	+5
- Carbonation temperature:	°C	+5
- Outlet temperature:	°C	+5

Table 4: Technological data

COMPRESSED AIR FOR INSTRUMENTS

- Inlet pressure:	bar	6
- Flow rate:	Nl/h	500

Table 5: Compressed air for instruments

WATER FOR OTHER VARIOUS

- Feeding pressure:	bar	3
- Flow rate	m^3/h	0.5

Table 6: Water for other various uses

CO_2 FOR CARBONATION

- Inlet pressure:	bar	10 max.
- Flow rate:	Kg/h	12 max.

Table 7: CO_2 for carbonation

COOLING MEANS (NOT PROVIDED)

Cooling solution (20% solution glycerine) circulating in the cooling section		
- Flow rate:	m^3/h	--
- Inlet pressure:	°C	--
- Outlet temperature:	°C	--
- Load losses:	bar	--

Table 8: Cooling means

3.1.0 ELECTRICAL CONTROL PANEL (DRAWING 712 - 116)

Attention!: **Before energising the electrical panel, make sure that all connections have been made according to the relevant diagram.**
Fasten any cable bolt that may have become loose during transport.
Make sure that the terminal relays are adjusted according to the motor's rating plate values.

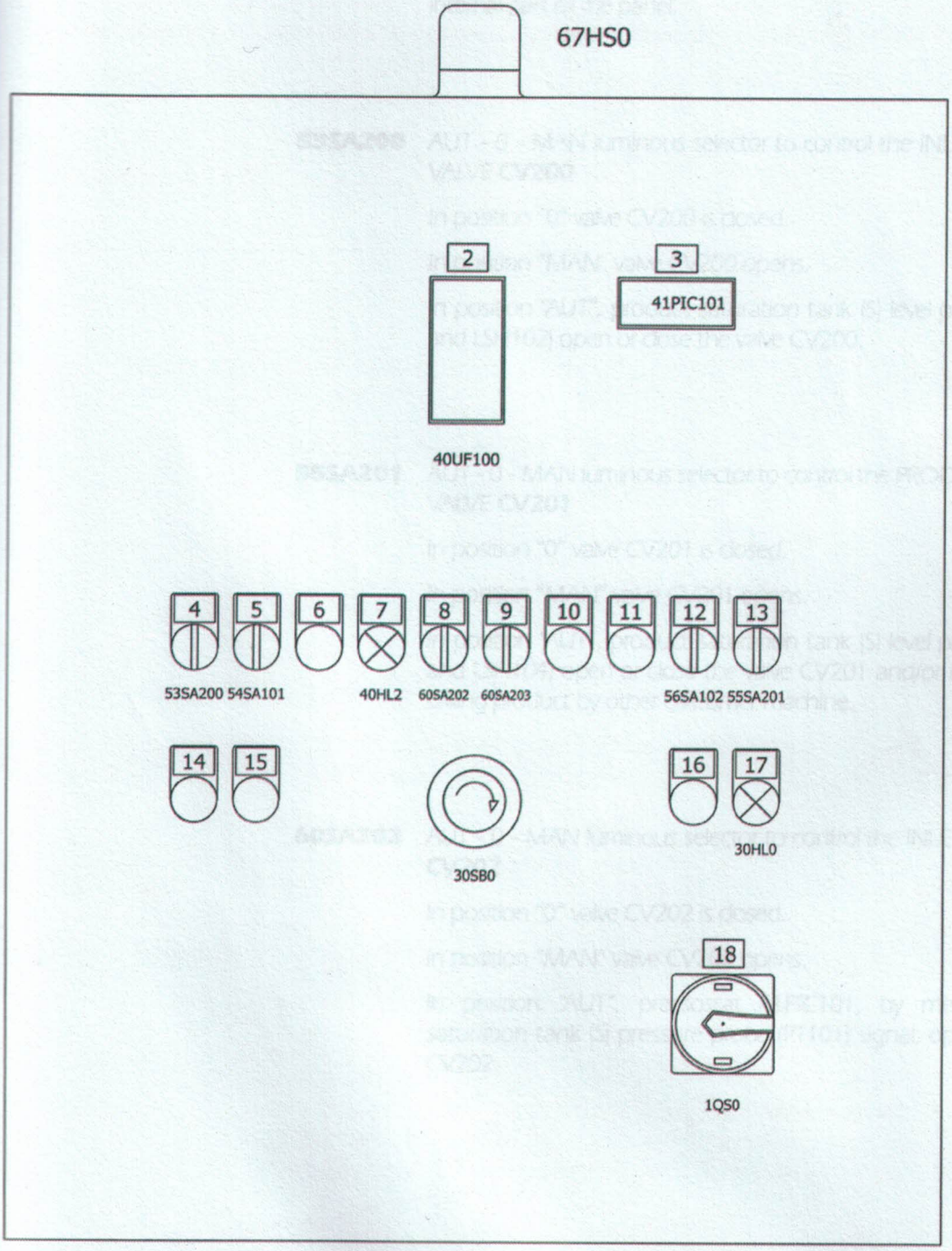


figure 3 Electrical control panel

67HS0 Luminous flashing ALARM signal (orange) for:

- CO_2 feed flow
- Motor overload

1QS0 GENERAL disconnecting switch

In position "1" it supplies voltage to the electrical panel.

In position "0" it clears the panel and opens the door to access the internal part of the panel.

53SA200 AUT - 0 - MAN luminous selector to control the INLET PRODUCT VALVE **CV200**

In position "0" valve CV200 is closed.

In position "MAN" valve CV200 opens.

In position "AUT", product saturation tank (S) level probes (LSL101 and LSH102) open or close the valve CV200.

55SA201 AUT - 0 - MAN luminous selector to control the PRODUCT OUTLET VALVE **CV201**

In position "0" valve CV201 is closed.

In position "MAN" valve CV201 opens.

In position "AUT", product saturation tank (S) level probes (LSL103 and LSH104) open or close the valve CV201 and/or missing signal calling product by other customer machine.

60SA202 AUT - 0 - MAN luminous selector to control the INLET CO_2 VALVE **CV202**

In position "0" valve CV202 is closed.

In position "MAN" valve CV202 opens.

In position "AUT", pressostat 41PIC101, by means product saturation tank (S) pressure probe (PT101) signal, opens the valve CV202.

60SA203 AUT - 0 - MAN luminous selector to control the CO_2 VENT VALVE **CV203**

In position "0" valve CV203 is closed.

In position "MAN" valve CV203 opens.

In position "AUT", pressostat 41PIC101, by means product saturation tank (S) pressure probe (PT101) signal, opens the valve CV203.

54SA101 AUT - 0 - MAN luminous selector to control the PRODUCT FEEDING PUMP **M101**

In position "0" pump M101 is stopped.

In position "MAN", pump M101 is running.

In position "AUT", pump M101 is running when inlet product valve CV200 is open.

56SA102 AUT - 0 - MAN luminous selector to control the PRODUCT OUTLET PUMP **M102**

In position "0" pump M102 is stopped.

In position "MAN", pump M102 is running.

In position "AUT", pump M102 is running when outlet product valve CV201 is open.

30SB0 EMERGENCY STOP

When pressed, the red mushroom button 30SB0 clears all control electrical equipment, except temperature gauges.

To reset, rotate in a clockwise direction.

40UF100 CO_2 FEED FLOW

Electronic microprocessor regulator, controls the density of CO_2 to the product feeding line, through the modulation valve MV260.

It has a minimum-flow value alarm and a maximum-flow value alarm that determines activation of the lighting alarm 40HL2 and the general alarm 67HS0. The alarms and the opening of the modulating valve MV260 are enabled only with pump M101 running.

41PIC101 CO_2 carbonation pressure

Electronic microprocessor regulator, controls the CO_2 pressure on product saturation tank (S), through the probe PT101.

It has a minimum-pressure value alarm and a maximum-pressure value alarm that determines the opening or closing of valves CV202 and CV203 (CO_2 admission and venting) if the selectors 60SA202 and 60SA203 are in "AUT" position.

30HL0 MOTOR OVERLOAD luminous signal

40HL2 CO_2 FEED FLOW luminous signal (flow meter FIT100)

5.3.0 INSTALLATION OF THERMOREGULATING UNITS (PNEUMATIC THERMOREGULATOR, IF FITTED)

Connect sensitive bulbs and pipes delivering air to the instruments, to pipe connections and to pneumatic servo-controls.
The control panel has a compressed air reducer and filter, to be connected to the distribution line.

Attention!:

Delivery air pressure must not exceed 6 bar.



Should an electronic thermoregulator be fitted, replace sensitive bulbs with temperature probes, type PT100.

5.4.0 PRODUCT CONNECTION

Inlet and outlet pipes must have a diameter equal to or larger than that of inlet and outlet connections.
A suction pipeline of insufficient cross-section could lead to cavitation phenomena.

5.4.1 COMPRESSED AIR CONNECTION

Connect the union on the control panel to compressed air distribution line.
Pressure at the inlet of the pressure reducing device located on the control panel must be higher than what indicated at table 6 on page 18.

5.4.2 CIP WATER CONNECTION

Connect CIP line to the plant.

5.4.3 CO_2 CONNECTION

Connect CO_2 line to the relevant connections, by means of pipes having diameter equal or larger than the connections.
CO_2 inlet pressure (12 bar minimum) will have to be adjusted by means of the relevant pressure reducing device, according to the type of operation to be carried out.

5.4.4 WATER CONNECTION FOR VARIOUS OTHER USES

Set up the water supply line to the pre-set attachments. The pressure and delivery capacity should be according to the description displayed in table 6 on page 18. Various other uses refers to the use of water in general, not implying necessarily the use of drinking water (eg. Pumps seals, cooling cycles, etc.).

6.2.0 CARBONATION ADJUSTMENT OF THE PRODUCT OUTLET

Adjustment is performed by means of **a pneumatic valve on the injector** (MV260 on attached P&I 33701-0044-00) and controlled by the 40UF100 regulator on electrical panel. According to its working position, this valve shall allow the introduction of CO_2 thus determining a change in bottling carbonation.

Legend: P&I 33701-0044-00

(S)	= Product saturation tank	20412871
M101	= Product feeding pump	46224450
M102	= Product outlet pump	46220245
---	= On-line injector of CO_2	46585326
---	= Static mixer	46104823
LSL101	= Level control	47518259
LSL103	= Level control	47518259
LSH102	= Level control	47518259
LSH104	= Level control	47518259
V100	= Discharge manual valve	31652020
V101	= Discharge manual valve	31652020
V102	= CO_2 discharge manual valve	41603103
V103	= Safety valve	41626024
V140	= Product inlet manual valve	31652023
V141	= Non-return valve	41612150
V142	= CO_2 interception manual valve	31652020
V143	= Product interception manual valve	31652030
V144	= Bypass interception manual valve	31652020
V145	= Product outlet manual valve	31652023
V146	= Product discharge manual valve	41655650
V160	= CO_2 inlet manual valve	41603103
V161	= CO_2 interception valve	41603103
V162	= CO_2 interception valve	41603103
V163	= Non-return valve	41610640
V164	= Non-return valve	41610640
V167	= Air interception valve	41655080
(YCV200)	= Solenoid valve (for valve CV200)	46535569
(YCV201)	= Solenoid valve (for valve CV201)	46535569
PI1	= Radial pressure gauge	46513510
PI2	= Radial pressure gauge	46513510
PI3	= Pressure gauge (on pneumatic system)	46510097
(PR101)	= Pressure gauge on PR101	46510097
(PR102)	= Pressure gauge on PR102	46510097
CV200	= Product inlet pneumatic valve	31652213
CV201	= Product outlet pneumatic valve	31652201
CV202	= CO_2 interception pneumatic valve	41638172
CV203	= CO_2 vent valve	41638172
MV260	= CO_2 dosage modulating valve	41652009
FIT100	= Flow meter	46560560
FIT101	= Flow meter	46560615
FIT102	= Flow meter	46560615

FIC100 =	CO_2 density regulator (40UF100)	46539661
TI1 =	Thermometer	46500018
SG1 =	Linear observatory	40030259
SG2 =	Linear observatory	40030102
PFR00 =	Air pressure reducer (pneumatic system)	46575505
PR101 =	CO_2 pressure reducer	46575505
PR102 =	CO_2 pressure reducer	46575505
PT101 =	Pressure transmitter	47916196

TI	=	Thermometer
PI	=	Pressure gauge
TT	=	Probe pt 100 or probe trg
FI	=	Flux indicator
PS	=	Pressure switch

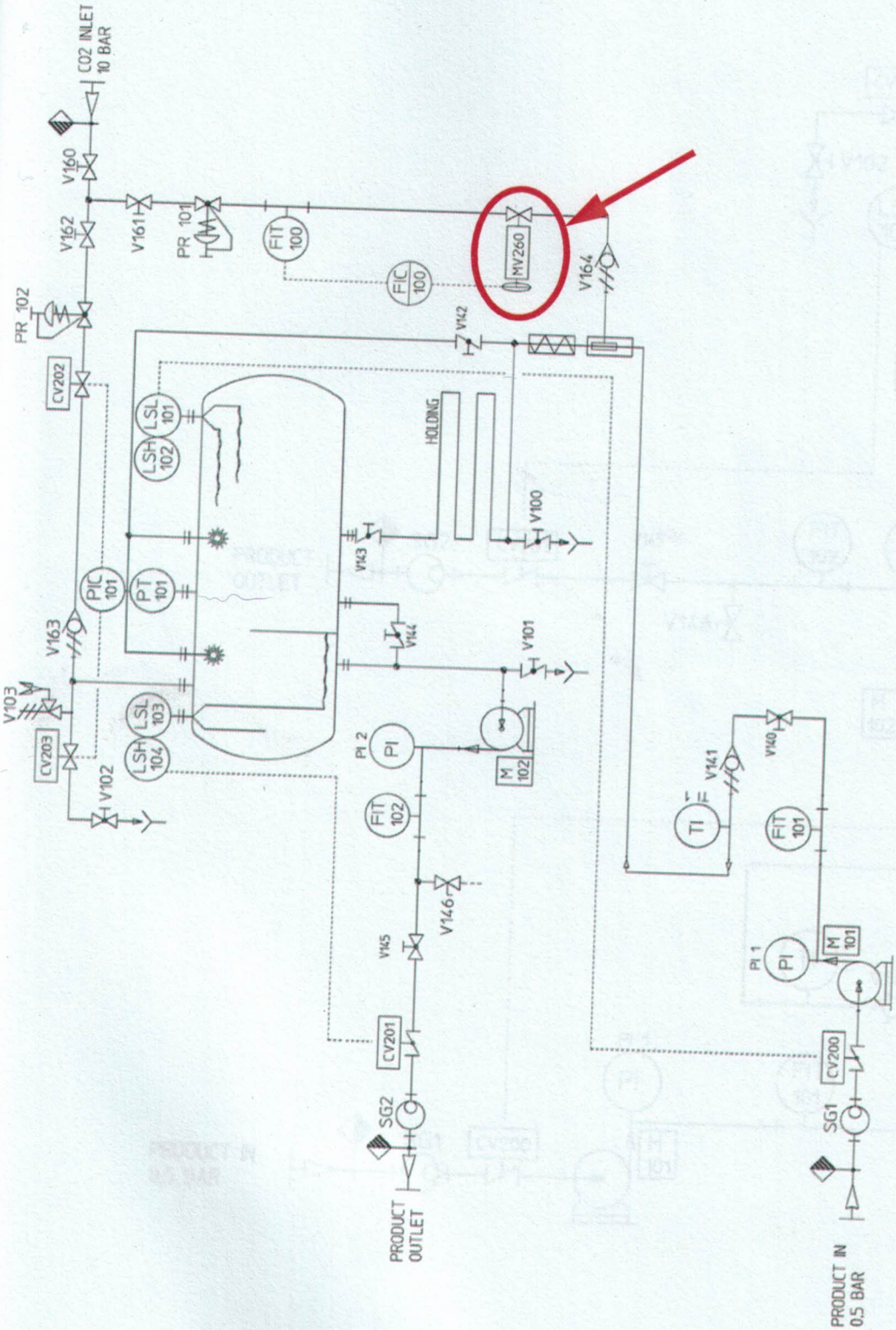


figure 9 *Valves positioning (P&I 33701-0044-00)*

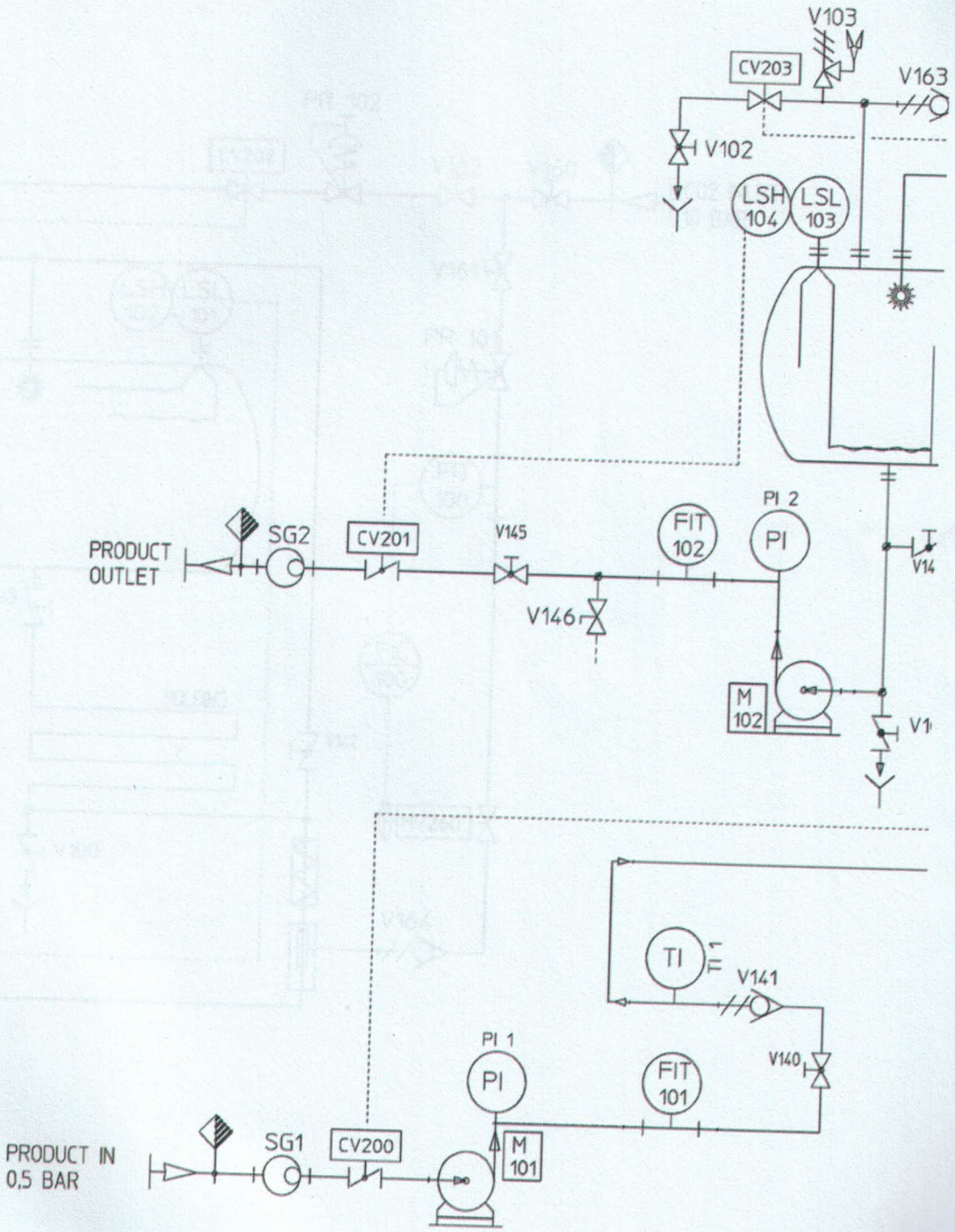


figure 10 ZOOM A - Valves positioning (P&I 33701-0044-00)

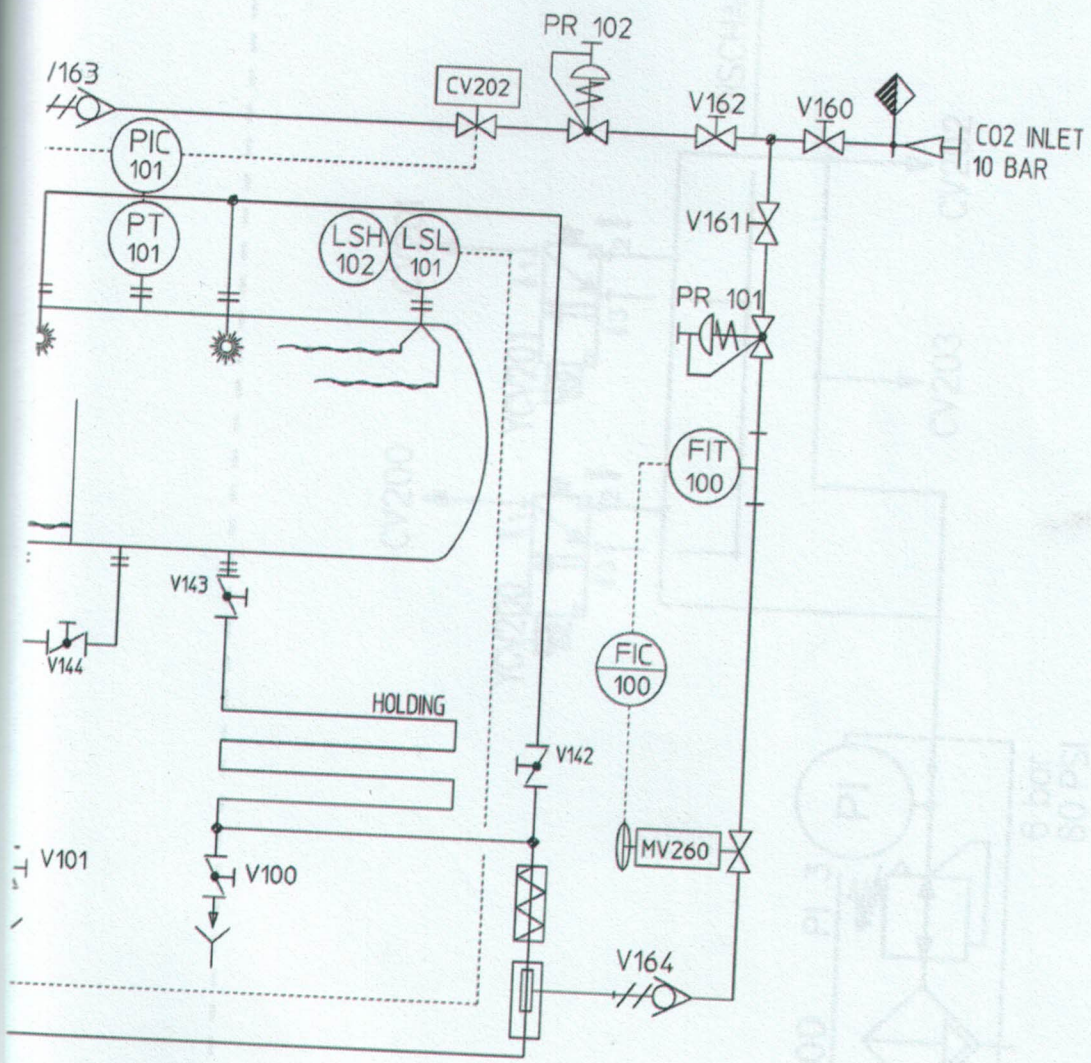


figure 11 ZOOM B - Valves positioning (P&I 33701-0044-00)

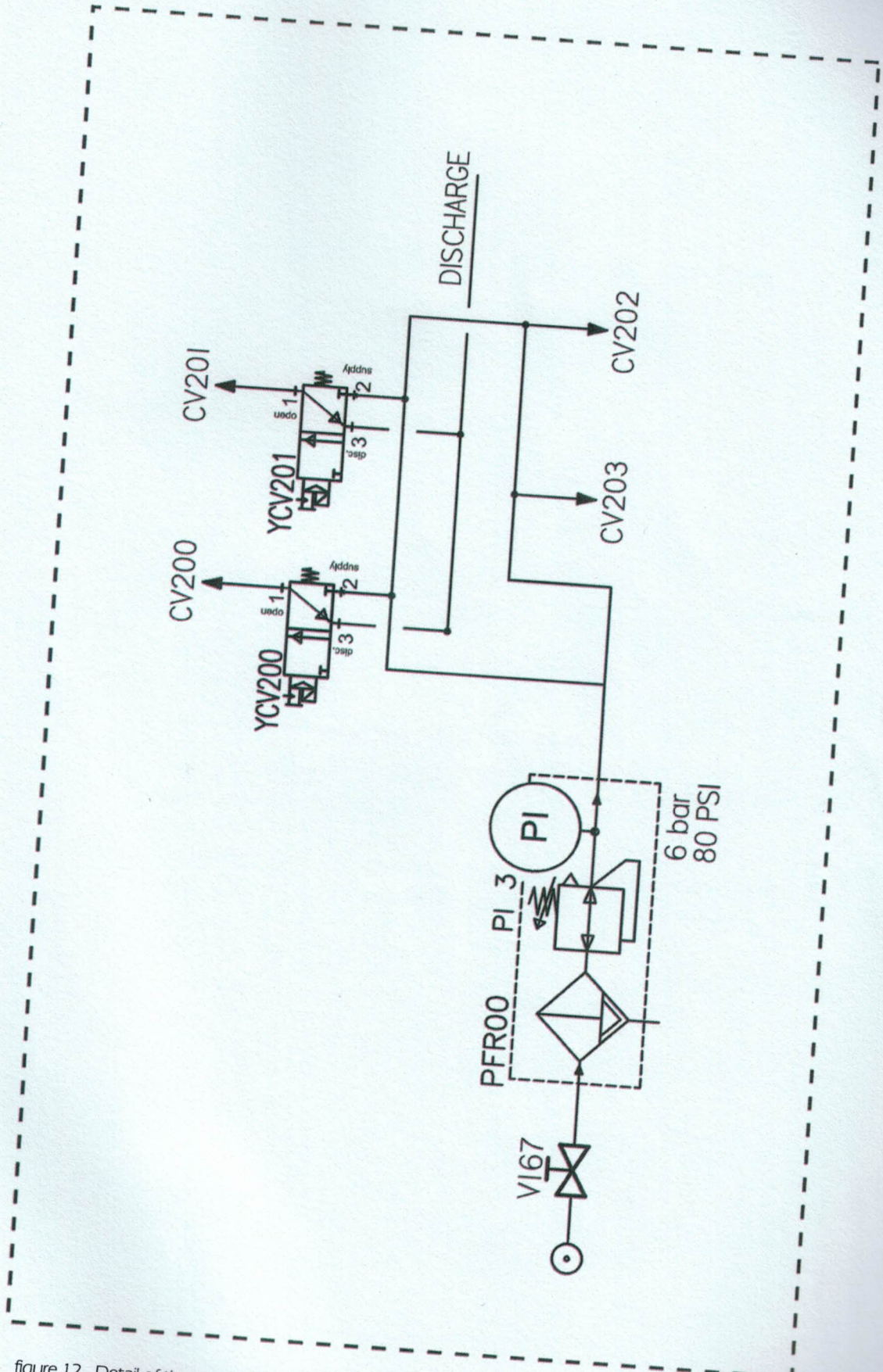


figure 12 Detail of the pneumatic diagram (P&I 33701-0044-00)

OPERATING INSTRUCTIONS

7.1.0 PRODUCT CARBONATION (REF P&I 33701-0044-00)

- Liquid coming from draw tanks first receives CO_2 (carbonation) into the product inlet piping, through an injector.
- Liquid with added CO_2 is then stored in the output saturation tank to be sent to bottling. In this saturator the area above the liquid is saturated with CO_2 kept at the maximum pressure of 8 bar, to avoid degasing the liquid.

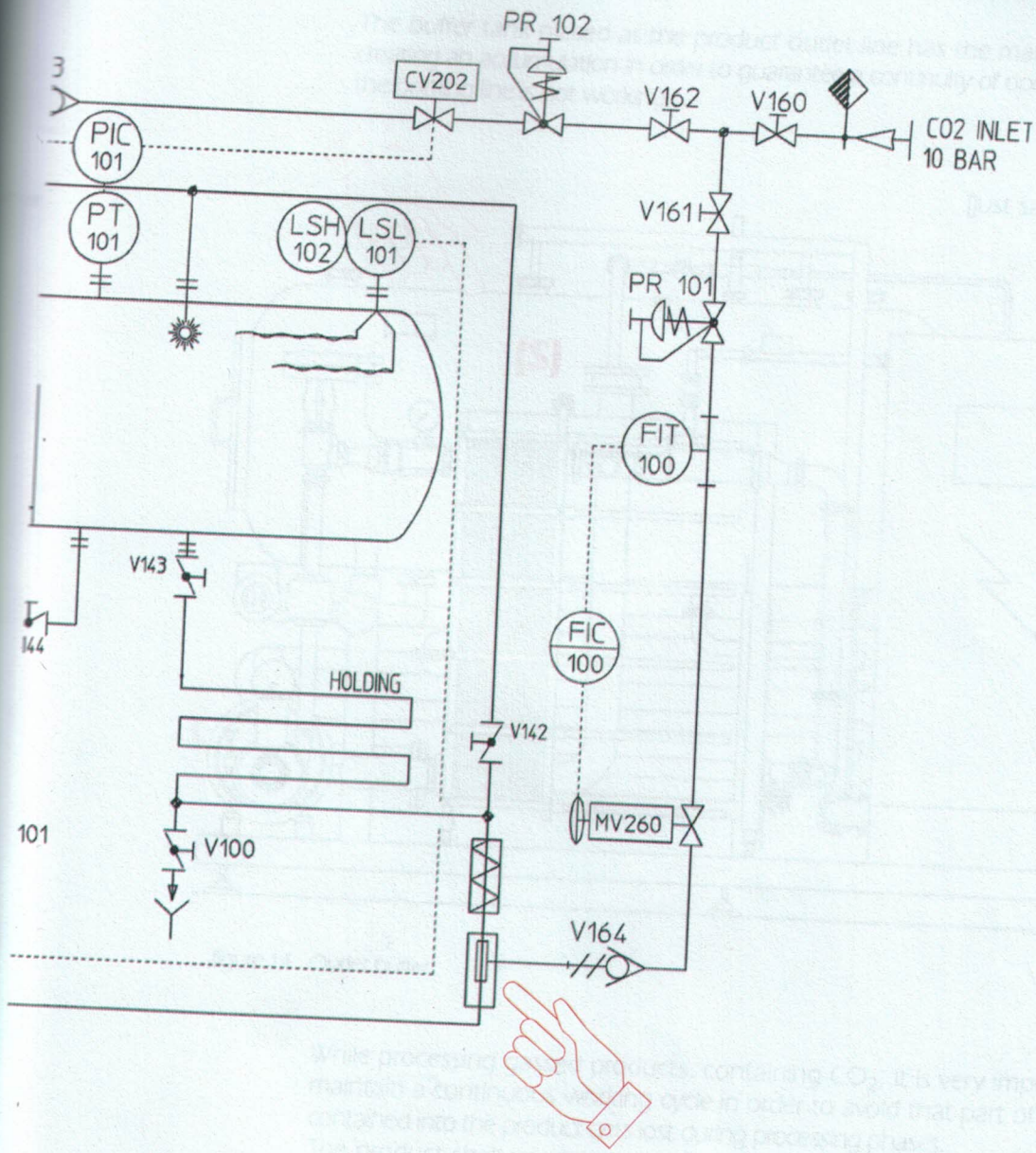


figure 13 CO_2 injector

7.2.0 OUTLET BUFFER

The buffer tank placed at the product outlet line has the main function of creating an accumulation in order to guarantee a continuity of operation in case the bottling line is not working.

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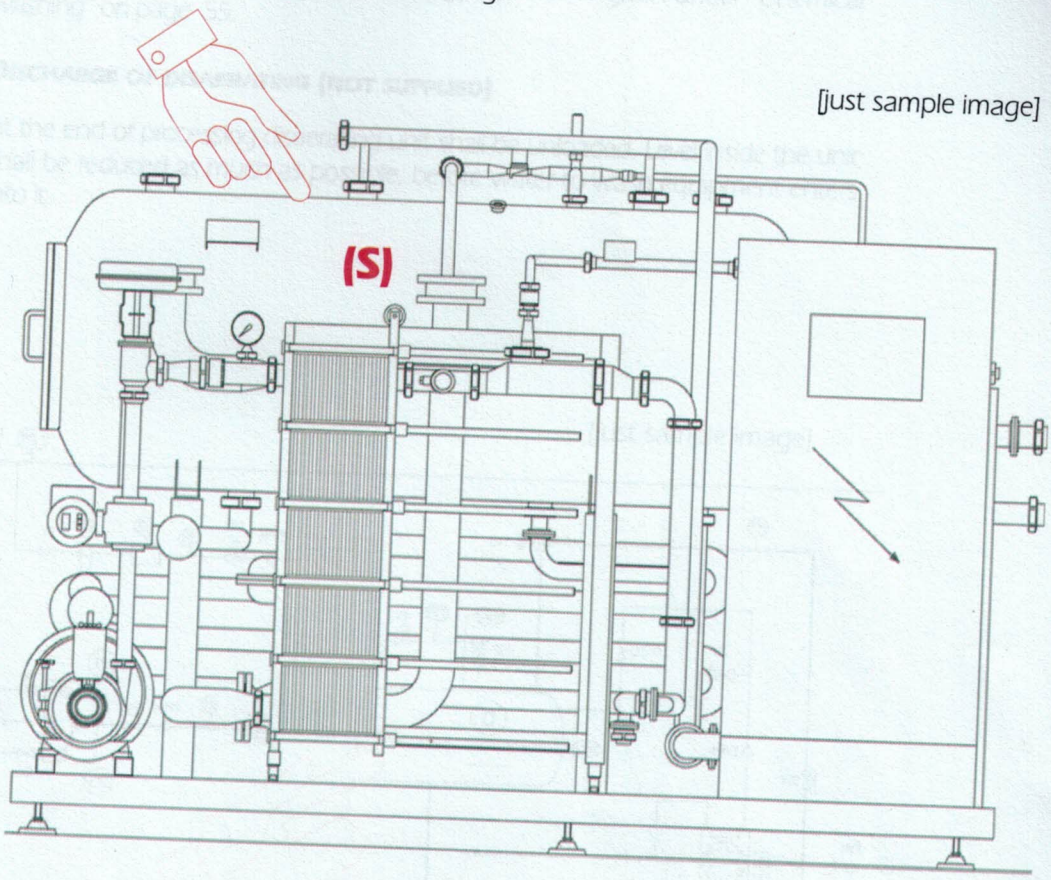


figure 14 Outlet buffer

While processing gassed products, containing CO_2, it is very important to maintain a continuous working cycle in order to avoid that part of the CO_2 contained into the product gets lost during processing phases.
The product shall need to pause for a certain amount of time at bottling temperature in order to eliminate any foam due to sudden pressure changes during the working cycle.
It is advisable to wash the tank with CO_2 before its filling in order to eliminate thoroughly any air present inside and thus reduce the oxidation risk of the product.
To this regards use CO_2 feeding group placed directly on the tank.
Pressure inside the outlet tank is determined by the envisaged working cycle.

7.3.0 SYSTEM DISCHARGE

It is performed at the end of working by introducing washing water instead of processed liquid, by means of the same inlet pump or any other pump.
Equipment shall be washed by following instructions given under "Chemical washing" on page 55.

7.3.1 DISCHARGE OF DISAERATING (NOT SUPPLIED)

At the end of processing disaerating unit shall be unloaded. Level inside the unit shall be reduced as much as possible, before water to wash equipment enters into it.

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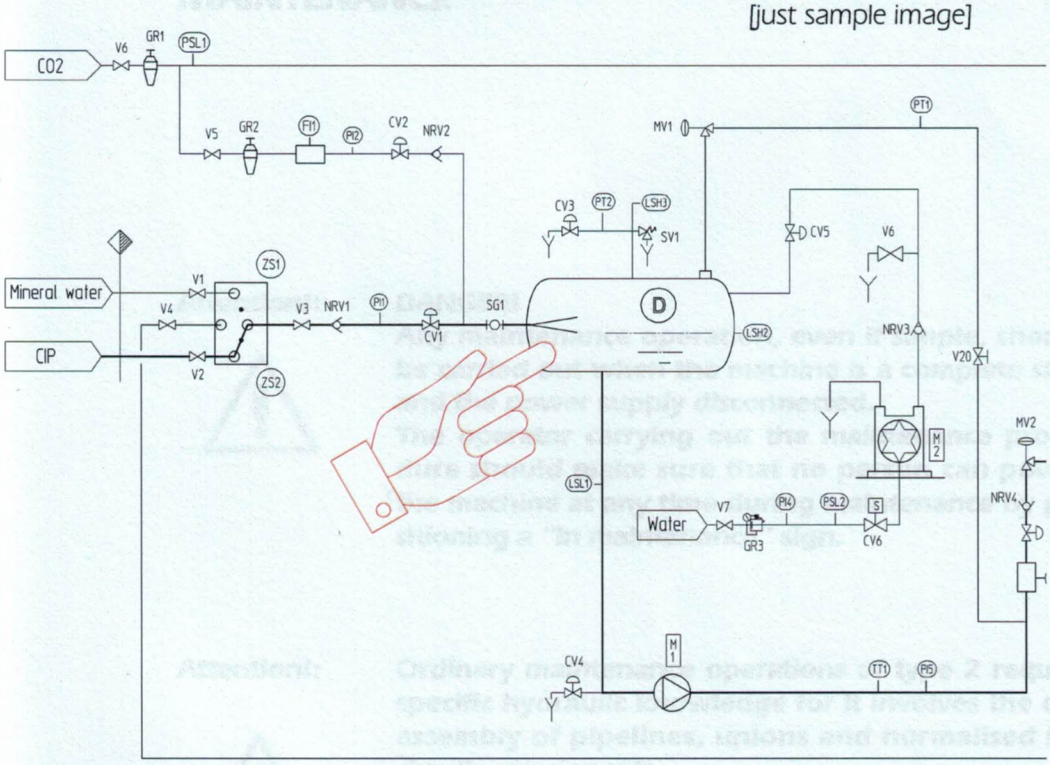


figure 15 Disaerating unit chart

- ELECTRIC DIAGRAM

Drawing No.	**712-116**
Project description	**MANUAL CARBONICATOR**
Job number	**016562**
Year of manufacture	**2017**
Customer code	**09993**
Customer	

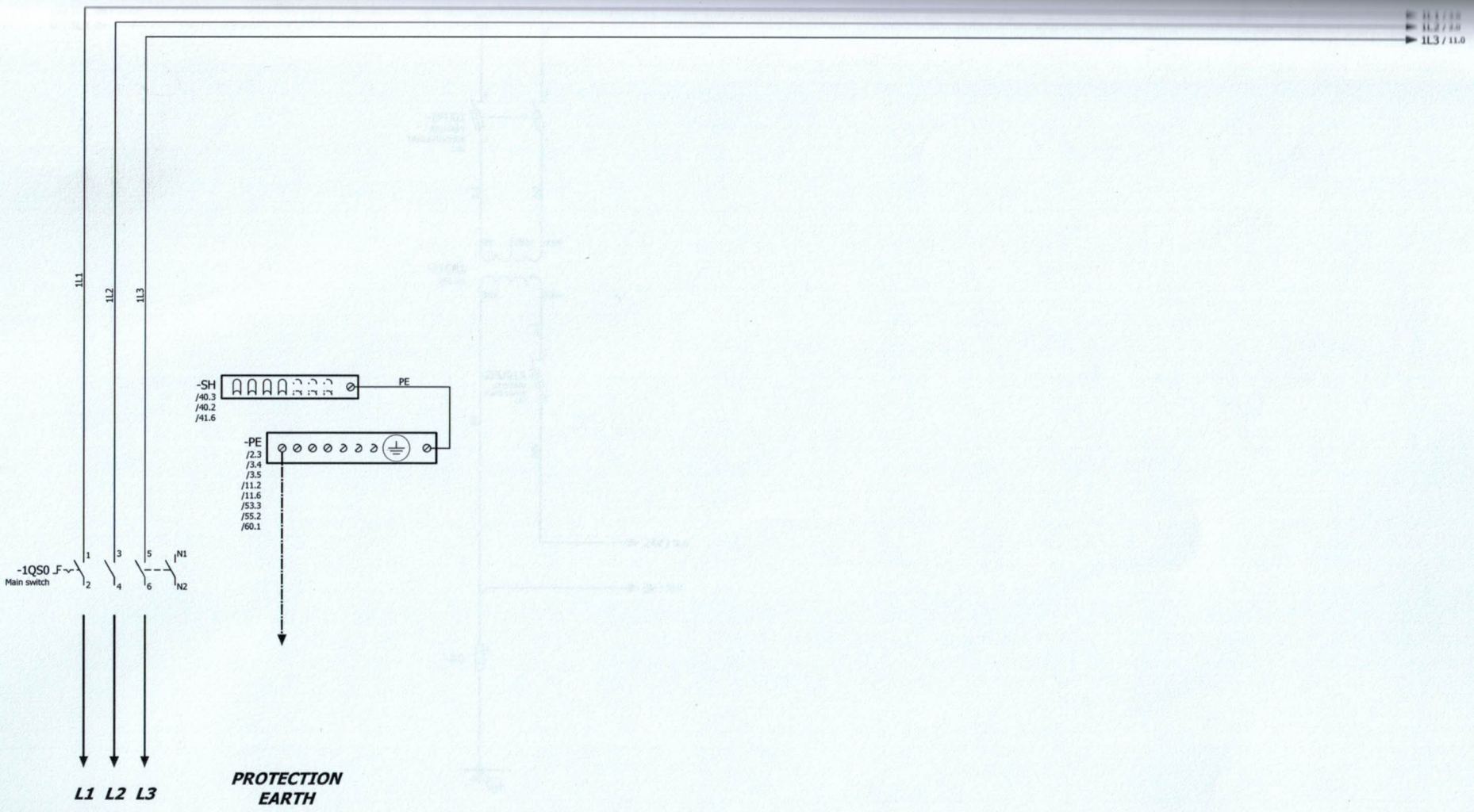
Panel Code	**27124005**
input lead	**3/PE AC 400 50 Hz**
Max absorbed power	**4 kW**
power supply	
Rated current	**7 A**
Frequency	**50 Hz**
control voltage	**24Vac - 24Vdc**

Responsible for project	
Created on	2017
Project end	
Edit date	01/02/2018
by (short name)	TMCI

Place of installation	
degree of protection	
environmental consideration	
Regulation	
Number of pages	49

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			Date	24/01/2018	MANUAL CARBONICATOR		Title page/cover sheet	712-116	= A +	Page 1
			Ed.	Lot M.						
			Appr					Commission 016562		Total pages 49
Modification	Date	Name	Original							



PRIMARY DISTRIBUTION
POWER SUPPLY
3/PE AC 400 V 50 Hz

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			Date	24/01/2018	MANUAL CARBONICATOR		Power supply	712-116	= L +	Page 1
			Ed.	Lot M.						
			Appr					Commission 016562		Total pages 49
Modification	Date	Name	Original							