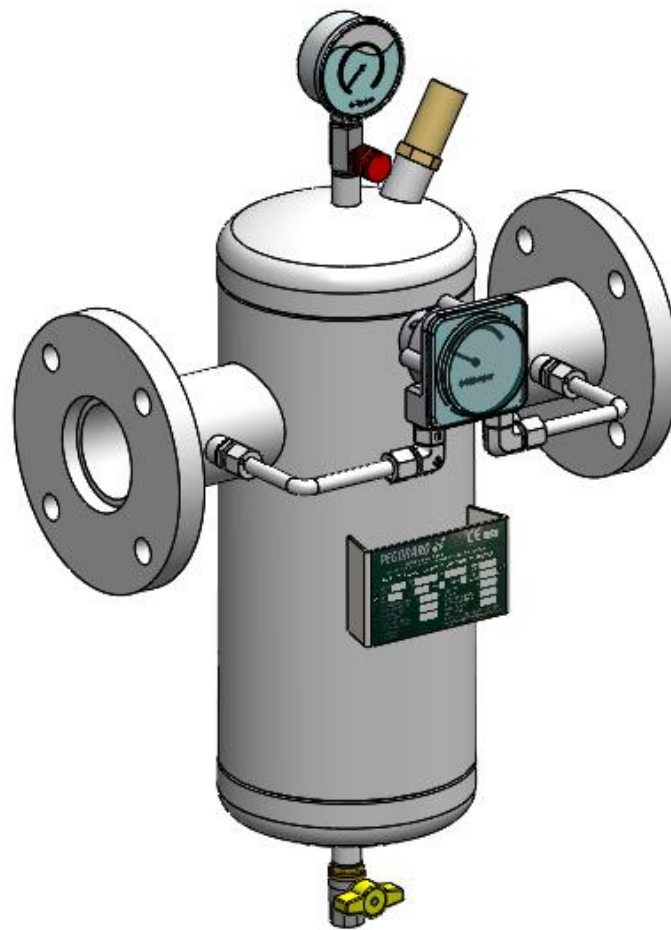


CONDENSATE SEPARATORS FOR LPG GAS

BRC FAMILY


MODULE H



USE AND MAINTENANCE MANUAL


Edition 09.2022 Rev.1

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1. INTRODUCTION

1.1. FOREWORD AND IMPORTANT WARNINGS

The **USE AND MAINTENANCE MANUAL** describes the plant operation and the correct procedures for carrying out the main use and routine maintenance.

The indications given in this manual are destined to a professional user who must have specific knowledge on the plant procedures of use, who must be suitably authorised, instructed and trained for the correct use and commissioning of the system so as to guarantee uninterrupted plant operation.

It is advised to read it careful before commissioning the plant. The manual must be kept in its specific housing on the plant or in an easily accessible place, protected against damage and always available for whatsoever future consulting requirements.


This manual must be complete and readable in all its parts, all operators who use the plant, or the person responsible for maintenance or regulation operations, must know where it is kept and must be able to consult it at any moment.

Should it be damaged or lost, you must ask for a new copy from the plant manufacturer. Should the plant be transferred to another owner, the manual must be handed over to the new user. The manual is considered an integral part of the plant.

For all components and appliances produced by third parties, please refer to the instructions included in their respective manuals.

The manual has been conceived so as to provide the user with all necessary information for using the plant in safe conditions, from the transport phase to scrapping.

The instructions given by this Use & Maintenance Manual are complementary to the accident regulations in force in the country of use of the plant (the instructions are not exhaustive but complementary to the safety provisions and/or requirements issued by the individual countries)

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1.2. MANUAL UPDATING

The information, descriptions and illustrations contained in this manual respect the state of the art at the moment the plant is placed on the market for the first time.

The Manufacturer reserves the right to make any changes to the type of plant at any time for technical or commercial reasons. Said changes do not require the Manufacturer to intervene on the plants that have already been placed on the market until that moment nor to consider this manual inadequate.

Any additions that the Manufacturer may deem appropriate to provide on a later date must be kept together with the manual and considered an integral part of it.

Although this manual contains the most up-to-date information, there may be minor differences between your plant and the one described in this booklet.

If you find any printing errors or indications that are unclear to you, or if you have any other concerns, contact your supplier.

1.3. COPYRIGHT

The copyright of this manual belongs to the plant Manufacturer.

This manual contains texts, drawings and illustrations of a technical nature that may not be disclosed or transmitted to third parties, in whole or in part, without the written authorisation of the machine Manufacturer.

Plant manufacturer
PEGORARO GAS TECHNOLOGIES S.R.L.
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 36057 Arcugnano (VI) - Italy

1.4. DESCRIPTION OF PICTOGRAMS AND SYMBOLS

In the manual the following symbols are employed to highlight particularly important instructions and warnings:



ATTENTION

This symbol indicates accident-prevention rules for the operator and/or for any exposed persons.



WARNINGS:

This symbol indicates that there is the possibility of causing damage to the product and/or to its components.



NOTE:

This symbol marks useful information



ATTENTION

Consult the instruction manual before carrying out any operations

MANDATORY

Use the Personal Protection Equipment (PPE)



Helmet



Hearing protection



Safety footwear



Gloves



Respirator



Safety Glasses



Protective Clothing



Safety Harness



DANGER

Explosion with splinters under pressure



DANGER

Potentially explosive atmosphere




DANGER

Electric Voltage



DANGER

Scalding hazard

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1.5. APPLIANCE INTENDED PURPOSE

The condensate separator is a mechanical device that captures the heavy particles commonly present in gaseous state. The system has been devised, designed and manufactured to be installed in LPG treatment and decompression stations with the function to collect the impurities and drain them by means of a drainage valve. The separators are suitable for use with natural gas, manufacturing gas, propane gas, air and other non-aggressive gases.

PEGORARO GAS TECHNOLOGIES s.r.l. declines all responsibility for any damage to things or persons in the event of:

- Handling, installation, commissioning, maintenance of the individual installed appliances and scrapping by non-qualified personnel;
- improper use of the plant;
- modifications, welding or damage;
- failure to comply with the current applicable safety standards and health and safety laws and regulations.
- operation at temperature and pressure higher than those specified in the rating plate;
- alteration or removal of safety protection components (electrical, electronic, electro-pneumatic, electro-mechanical).
- removing, painting over or covering plant identification plates and warning symbols.
- installation errors;
- lack of proper maintenance;
- failure to comply with the content of this user manual

2. APPLIANCE OPERATION

2.1. GENERAL DESCRIPTION (FIG.2.1)

The BRC family condensate separators of the baffle type.

During operation the gas passes through the inlet arriving into the separator casing (1) and impacts on the baffle being subject to a reduction in speed causing a separation of the particles, even the liquid ones, with larger dimensions and weight.

The gathered impurities are accumulated at the bottom of the vessel from where they can be regularly drained by means of the drain valve (5).

The separator is fitted with a needle valve (2) and a pressure gauge (3) to monitor the plant working pressure or to indicate the presence of pressure in the device. An optional safety valve (4) can be fitted to prevent and discharge any overpressure in the vessel. A differential pressure gauge (6), which is also optional, can be fitted to check the level of clogging and if required discharge the separator from impurities.

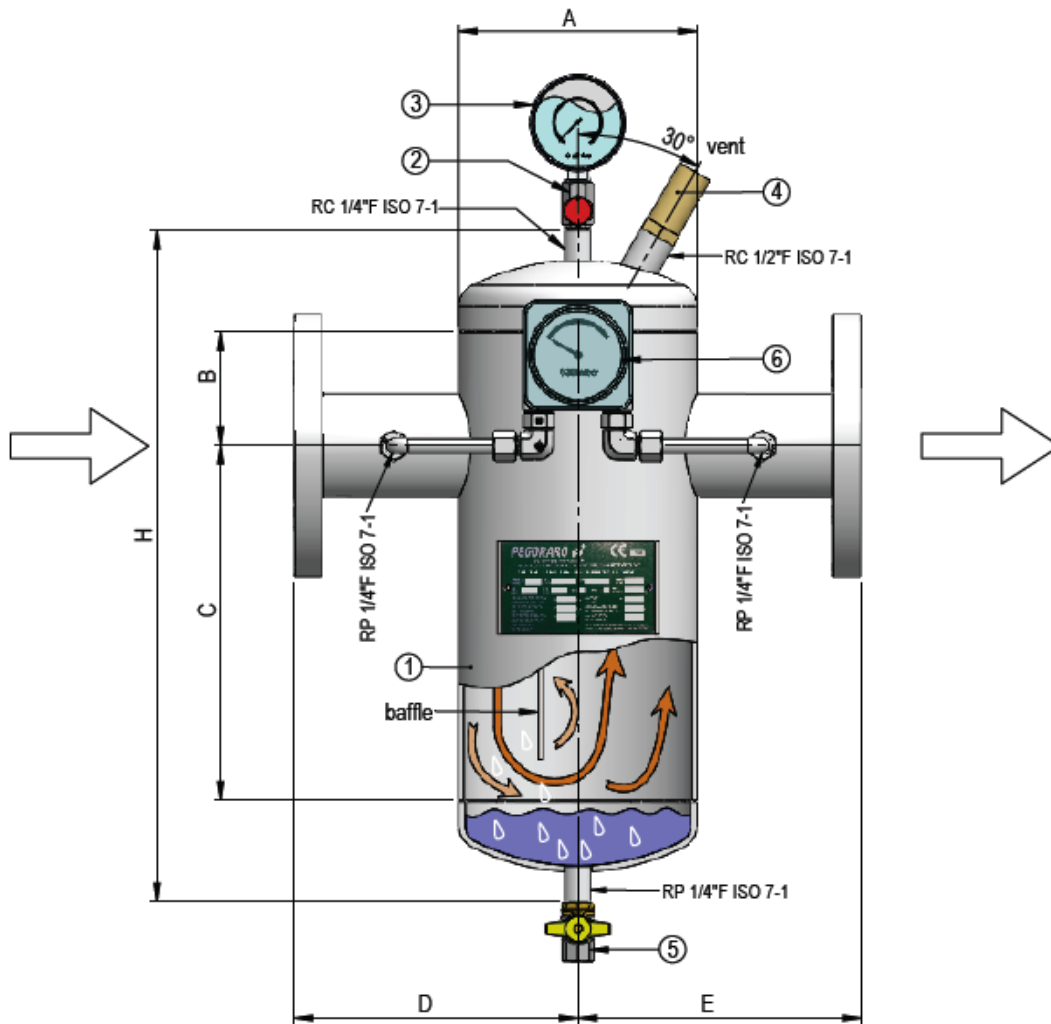


Fig. 2.1 – BRC condensate separator

- | | | | |
|---|-----------------------------|---|--|
| 1 | Condensate separator casing | 4 | Safety valve (optional) |
| 2 | Needle valve | 5 | Bleeding valve |
| 3 | Pressure gauge | 6 | Differential pressure gauge (optional) |

3. GENERAL SAFETY WARNINGS

3.1. RISKS DERIVING FROM OPERATING THE APPLIANCE

The condensate separator operates in a pressurised circuit with flammable fluids. Consequently the following main risks may occur:

- Explosion/fire, with consequent potential loss of gas due to faults in the plant components or to their mechanical connections;
- Expulsion of elements of mechanical components and/or of their connections subject to pressure with consequent structural failure of the seal components (for instance gaskets and nuts/bolts);
- Mechanical crushing hazard of limbs or parts of the body during plant installation/dismantling operations;
- Electrocutation hazard deriving from stray currents or lightning, if not suitably insulated by an earth connection.

4. TECHNICAL CHARACTERISTICS

4.1. PLANT MARKING

The plate (Fig. 4.1), marked with the plant data is applied and fixed on the casing of the condensate separator (Fig. 2.1). The plate must be always intact and well visible. It is strictly prohibited to remove, cover and/or tamper with, even partially, the data it contains.





										
PEGORARO PEGORARO GAS TECHNOLOGIES S.R.L., VIA MEUCCI, 77, 36057 ARCUGNANO (VI), ITALY		0948		0088						
BARILOTTO RACCOGLI CONDENSA - CONDENSATE SEPARATOR - SERIES CANOVA1000										
⊕	FAMIGLIA FAMILY	<input type="text" value="BRC"/>	TIPO TYPE	<input type="text"/>	S.N. S.N.	<input type="text"/>	ANNO YEAR	<input type="text" value="20"/>	⊕	
	DN _i DN _{in}	<input type="text"/>	DN _e DN _{out}	<input type="text"/>	PN 40 <input type="checkbox"/>	ANSI 300 <input type="checkbox"/>	ANSI150 <input type="checkbox"/>	PESO WEIGHT	<input type="text"/>	Kg
	PRESSIONE MAX AMMISS. MAX ALLOW PRESSURE	PS	<input type="text" value="20"/>	bar	CAPACITA' VOLUME	V	<input type="text"/>	l		
	PRESSIONE DI PROVA TEST PRESSURE	PT	<input type="text" value="28.6"/>	bar	CATEGORIA PED/PER PED/PER CATEGORY	<input type="text"/>				
	TEMPERATURA MIN/ MAX TEMPERATURE MIN/ MAX	TS	<input type="text" value="-10 ÷ 215"/>	°C	FLUIDO GRUPPO I FLUID GROUP I	<input type="text"/>				

Fig. 4.1: Model of identification plate

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4.2. TECHNICAL SPECIFICATIONS

The technical specifications of each individual plant are reported on the plant identification plate.

DESIGN DATA			
Description		U.M.	Value
Design pressure	PS	Bar	See Rating Plate
Design temperature	TS	°C	See Rating Plate
Max. working pressure		Bar	See Rating Plate
Operating temperature		°C	-10/+215
Inlet diameter	DNin		See Rating Plate
Outlet diameter	DNout		See Rating Plate
Unloaded weight	P	Kg	See table
Hydraulic test pressure	PT:	Bar	See Rating Plate
Volume	Lt	Lt	See Rating Plate
Fluid	Type of fluid		LPG
	Physical state		Gas/Vapour
	Nature of the fluid		Inflammable
	Specific weight		-
Calculation code			(BS) EN 13445
Cat. According to directive 2014/68/EU (PED) –S.I.2016/1105(PER)			See Rating Plate
Dimensions			BxLxH

Dimensions Table (Fig. 2.1)

DIMENSIONS											
Models	INLET	OULET	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	H [mm]	Volume [lt]	Weig [Kg]	Cat. PED
BRC-25P	DN 25	DN 25	ø 4"	60	150	150	150	326	2,5	6	I
BRC-32P	DN 32	DN 32	ø 4"	60	150	150	150	326	2,5	8	II
BRC-40P	DN 40	DN 40	ø 5"	70	200	175	175	393	4,9	10	II
BRC-50P	DN 50	DN 50	ø 5"	70	200	175	175	393	5,1	12	II
BRC-65P	DN 65	DN 65	ø 6"	80	250	200	200	473	9	17	II
BRC-80P	DN 80	DN 80	ø 8"	80	300	225	225	541	17,5	24	III
BRC-100P	DN 100	DN 100	ø 8"	100	300	225	225	561	19	26	III
BRC-125P	DN 125	DN 125	ø 10"	125	350	275	275	659	35,5	40	III
BRC-150P	DN 150	DN 150	ø 12"	150	400	300	300	788	60	59	III
BRC-200P	DN 200	DN 200	ø 16"	200	500	400	400	994	122	109	III

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Flow rate table

FLOW RATE TABLE KG/H GPL												
WORKING PRESSURE												Max. Flow
DN	100 mbar	200 mbar	300 mbar	400 mbar	500 mbar	750 mbar	1 bar	1,5 bar	2 bar	2,5 bar	3 bar	20 bar
25	53	58	62	67	72	84	96	120	145	169	193	1051
32	87	95	102	110	118	138	158	197	237	277	317	1722
40	135	148	160	172	185	216	246	308	370	433	495	2691
50	211	231	250	269	289	337	385	482	579	676	773	4204
65	357	390	422	455	488	569	651	814	978	1143	1307	7105
80	541	591	640	689	739	862	986	1234	1482	1731	1980	10763
100	846	923	1000	1077	1154	1347	1541	1928	2316	2704	3094	16817
125	1322	1442	1562	1683	1804	2105	2407	3012	3618	4225	4834	26276
150	1903	2076	2250	2424	2597	3032	3466	4337	5210	6084	6961	30377*
200	3383	3692	4000	4308	4617	5389	6162	7711	9262	10817	12374	28125**

* Calculated for 16 bar - ** Calculated for 8 bar

5. TRANSPORT, INSTALLATION AND ASSEMBLY

5.1. TRANSPORT AND HANDLING

The plant must be handled by qualified and trained staff. Specific precautions must be taken in conformity with local safety regulations. Unnecessary personnel must be moved away.


Upon reception, check that the received material conforms with what is indicated on the delivery note.

When unpacking follow the instructions indicated below:

Check that there are no visible signs of damage on the case that may have occurred during transport

- Carefully remove the packing material
- Check that the separator, does not show visible signs such as dents, scratches and damage that may have occurred during transport.

In the event of serious damage, immediately warn the transport company and Pegoraro Gas Technologies.

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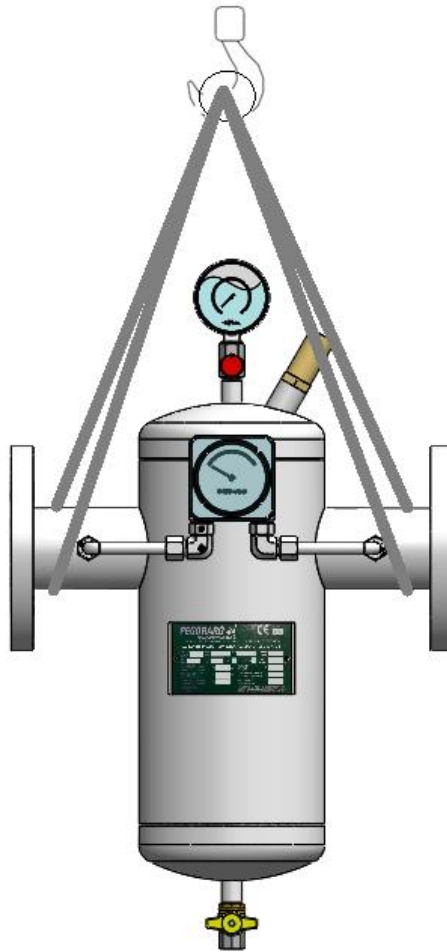


Fig. 5.1 – Handling the condensate separator

The appliance and its components must be handled after having evaluated which lifting equipment is suitable for the loads to be lifted (lifting capacity and functionality). The appliance must be handled by means of the lifting points provided for the appliance itself (Fig. 5.1).



ATTENTION


It is good practice to use lifting equipment with sufficient lifting capacity to hold the weight of the plant increased by about 20%.



WARNING

The plant is supplied painted. However, accidental knocks during installation could cause loss of efficiency of the paint or zinc coating, triggering a slow process of oxidation (rust), so it is recommended to restore the original protection with RAL 9005 paint or cold zinc coating.

5.2. STORAGE

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After receiving and inspecting the plant, if it is not installed immediately, the unit must be repacked (where required) and stored suitably in a clean and dry place.

It is advised to proceed as follows:

- Store the plant and the accessories in a closed, clean and dry place not subject to vibrations.
- drain completely any fluid contained in the condensate separator.
- cap the inlet and outlet connection against the ingress of foreign bodies, dust and dirt.

Refer to the manuals of the individual accessories for optimal storage.

5.3. INSTALLATION AND ASSEMBLY


Before proceeding to install the appliance ensure that the operating conditions conform with the characteristics given on the rating plate.

Provide yourself with all the equipment and personal protection equipment.

- It is forbidden to have the separator installed by personnel that has not been suitably trained.
- The separator must be installed in a well-ventilated area.
- The installer must provide suitable seals for all piping connections.
- The condensate separator must not be subject to static and dynamic loads and to bending movements.
- Check that the separator is correctly connected to the equipotential earth network.

You must also ensure that:

- the separator can be inserted into the space provided and that there is sufficient space to carry out future maintenance work;
- the piping upstream and downstream are at the same level as the inlet and outlet nozzles;
- the inlet/outlet flanges of the piping are parallel with those of the separator;
- the condensate separator inlet/outlet flanges are clean and the condensate separator itself has not been damaged during transport;
- the piping upstream has been cleaned to expel residual impurities such as welding slag, sand, paint residue, water, etc.
- the separator must be installed in the line orientated according to the gas flow (Fig. 2.1).

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6. COMMISSIONING AND MAINTENANCE

6.1. COMMISSIONING

6.1.1. GENERAL WARNINGS FOR CORRECT OPERATION OF THE PLANT



ATTENTION

During the commissioning phase, absolutely avoid smoking and using naked flames, explosion hazard.

Before commissioning the plant, ensure that the stop valves are closed. Failure to observe this condition can cause severe damage to the plant. Pegoraro Gas Technologies S.r.l. declines all responsibility for any damage to property or persons caused by failure to observe these instructions.

6.1.2. PLANT START-UP

- Before commissioning, we recommend checking that the operating conditions conform with the characteristics on the appliance rating plate;
- Before doing any work it is important to ensure that the gas upstream and downstream stop valves have been closed and that the pressure has been discharged in the sector of piping between the stop valves;

Ensure that the bleeding valve is closed and try to pressurize the separator slowly by means of the valve upstream from the process. Ensure, by means of a seal test at working pressure and by means of a foam test, that there are no leaks between the connections.




WARNING:

Opening this valve too quickly may cause irreversible damage to the separator.

So pay due attention to this operation.

An excessively rapid introduction of high pressure gas causes a sudden decrease in temperature and, because of expansion, this would cause ice formation. As it is well known, ice can cause pipes to break with consequent leakage of gas into the circuit.

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6.2. MAINTENANCE

The plant maintenance must be carried out by qualified and trained staff. Before doing any work it is important to ensure that the separator's upstream and downstream stop valves have been closed and that the pressure has been discharged in the sector of piping between the stop valves.



ATTENTION

During maintenance, absolutely avoid smoking or using naked flames: risk of explosion.

Have the appliance and connections checked by expert, qualified personnel.

NEVER try to repair or restart the appliance on your own.

Pegoraro Gas Technologies S.r.l. declines all responsibility for any damage to things or persons caused by inadequate repair of the equipment by non-qualified personnel

The maintenance operations depend considerably on the quality of the piped gas. Except regular regular bleeding operations the separator does not require particular maintenance.

7. CONFORMITY:

The plant has been made by the manufacturer in conformity with Directive 2014/68/UE PED and S.I. 2016/1105 PER and is certified and bears the CE/UKCA mark, if this marking is envisaged.

8. SCRAPPING

At the end of its working life, refer to the applicable regulations of the country where the plant is installed.

9. ENCLOSED DOCUMENTATION

9.1. LIST OF ENCLOSED DOCUMENTATION

- Instructions manual
- Accessories instructions manual (where available)