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0- INTRODUCTION

THE PRESENT OPERATING INSTRUCTIONS IN GENERAL, MUST BE CONSULTED BEFORE PLACING IN OPERATION ANY SAFETY DEVICE MARKED CE AND ARE AN INTEGRATIVE PART TO THE INFORMATION CONTAINED IN THE SPECIFIC TECHNICALMANUAL OF THE PRODUCT.

The present manual is appropriate for the assembler/user and contains all the necessary information concerning safety in connection with: handling and transport, installation and assembly, set up, utilization, maintenance and inspection by the user, precautions on surplus hazards.
The present document must be brought to knowledge to the authorized personnel and is addressed to qualified technical persons and to the user of the valve a/o of the machine on which it is installed, and is the responsibility of these to read the indicated instructions.
During the phase of INSTALLATION – USE – MAINTENANCE – INSPECTION – CUT OUT, the user must pertain precisely to the present instruction manual and strictly respect everything foreseen in the procedures concerning safety and workplace hygiene.

1- PRODUCT DESCRIPTION

1.1. Classification and marking

The valve has been accomplished through a manufacturing process in compliance with the essential safety requisites on the 97/23/CE Directive.
It shall be the responsibility of the assembler/user of the pressure washer to carefully observe the directions foreseen by the appliable national directives, the norm CEI EN 60335-2-79 and prEN 1829 project, as well as the directions contained in the present document.
The unequivocal identification of the valve is proven by the data plate stamped on the valve body and by the conformity declaration certifying that the apparatus under pressure has undergone a conformity valutation of norm article 10 of D.Lgs 93/00, according to the module A category I fluid of group II (hot water + unoxious detergents).
The CE marking is conform with the directive 97/23/CE and therefore guarantees the exclusive conformity to such directive and to the applied norms indicated in the present document.
It is understood that the conformity of the declared and marked pressure apparatus does not cover the conformity of the apparatus a/o assembled together or rather the finished machine.
Under no circumstances is it possible to make any modifications in a autonomous manner to the valve resulting in the decline of the conformity of guarantee.
It is forbidden to use the apparatus with fluids other than those declared.
Therefore it is under the assemblers responsibility to verify the conformity, where necessary, of other directives.
The construction data related on the body, emphasize the acknowledged limits for utilization also mentioned on the test report and conformity declaration.

Warning for the assembler – Overall procedure

Under the circumstance for the installation of the present accessory in a ensemble, as described by the same directive, it is the final assemblers assignment to verify the adaptability and reliability with other apparatus.
The assembler has the obligation also to verify the connections in correspondence with the threaded joints, where optimum conditions of tightening are indicated.

1.2. Identification and components: design and structure

Verification of conformity as per 97/23/CE

Apparatus	Valves series VS & VB
Year of production	See test certificate
Final product control data	See test certificate
Chart	2 & 4 (art.3 par.1.1, letter b)
Max pressure permissible body PS	See test certificate
Min and max pressure exertion	See test certificate
Min and max temperature exertion	See test certificate
Hydraulic pressure test on body PP	See test certificate
Min & max body temp.permissible TS	0/+90 ℃
Min & max exertion temperature	0/+60 ℃
Category	I – or articole 3.3. *
Applied modulus certificate	A – or to norm *
Fluid group	Group 2 (water + detergents)
Dimensions	See product technical manual
CE Marking	Present on body

The production date is engraved on the valve body such as on the conformity documents.
The valve consists of a main body that resists to pressure, in which the apparatus connections to protect or adjust are put into effect, and by internal parts that allow the performance of the desired and declared safety functions.

1.3. Use

The valve in subject is appropriate for a technological use to perform safety functions on pressure washers under the norm CEI EN 60335-2-79 or prEN 1829, is adaptable to discharge hot water and water-detergent mixtures or steam and detergents (excluding ammoniac and nitrogenous types), when the exertion pressure of the machine a/o its accessories exceed the calibration values of the valve.
The valve does not protect apparatus that have a programmed max pressure inferior to the calibrated pressure of the valve.
THE PRESSURE WASHER ASSEMBLER IS OBLIGED TO FIT CORRECT SAFETY DEVICES THAT PROTECT THE APPARATUS UNDER PRESSURE IN ORDER TO GUARANTEE A CONFORM FUNCTION IN LINE WITH THE PLAQUE CHARACTERISTICS AND THE INFORMATION DETAILED IN THE PRESENT DOCUMENT.

1.4. Terminology

- Qualified technician is intended as each person trained for the operations of installation, adjustment, maintenance; it is compulsory for the competent technician to have been trained and qualified for such assignments and to possess a certain knowledge of the apparatus and the risks in connection with their use.
- Pressure apparatus is intended as the Valve, subject of the present manual.
- Ensemble is intended as the Pressure Washer, assembled with other parts or with other pressure apparatus a/o safety devices (safety valves).
- Machine is intended as the complete ensemble equipped with all the functional and control accessories fitted by the assembler.
- TS is intended as the Min. and Max. permissible temperature of the valve.
- PS is intended as the Max. permissible pressure of the valve.
- DPI are intended as the individual protection devices.
- Fluid is intended exclusively for hot water + detergents.
- Valve is intended as safety valve VS type, and simultaneously the term Valve determines a safety valve.
- PP is intended as the hydraulic pressure test on the valve body.

2- INSTRUCTIONS

2.1. Installation

ATTENTION
Any installation or reinstallation must be carried out by specialized personell duly informed on the relevant risks, even regarding the instructions on this present manual.
Before installation make sure that the valve corresponds to the supplied documents.

During installation observe the flow direction indicated by arrows on the valve body and illustrated on the technical drawings, in order to allow with the help of drainage tubes, a smooth discharge of expected maximum flows and absence of extraordinary condensation in the valve discharge space and drainage pipe.
It is necessary to foresee a discharge tube channelled in the atmosphere or in a suitable sloping tank (self drained for gravity) and with a minimum section in line with the valve outlet; curves turned upwards directly to the valve outlet, must be avoided.
The valve discharges have to be protected from the cold and not directed in such a manner to produce danger for persons a/o things.
Unwanted organics must be avoided in entering the tubes to reach the valve which can prevent the regular fluid discharge, therefore whenever reintegrated tank collectors are used it is compulsory to assure protection to such containers from substances and foreign bodies from the regular function of the pressure washers and protection (intake filters are suitable).

The present apparatus is installed according to such procedure :

1-Make sure that no obstacle is found between the valve and apparatus; in case of more valves connected to a single channel of the receptacle, the section must not be inferior to the total of sections of the single valves for installation;
2-It is fitted to non pressurized apparatus and totally void of the product to hold, therefore it is necessary to check the condition both on the main installation phase and reinstallation phase after servicing a/o maintenance, and in any case each time the valve has been dismounted from the tank it protects.

- Engage the connection tubes following the norm of a proper technique
- After installation it is necessary to verify, by the assembler a/o user, the correct coupling of the openings and their use.
- The valve appears steady after calculations derived from the torque conditions foreseen by the functional operative characteristics of pressure washers.
- Proceed with the calibration test as foreseen in the specific technical manual of the product.

ATTENTION:
Installation errors due to an incorrect workmanship from the mentioned procedures, can cause deformation or a constructional weakness of the connection tubes or else a fluid loss in the ambient.
The present apparatus is disengaged only and solely after having verified the absence of pressure in the internal part.

2.1.1. Characteristics of storage, conservation, transport and handling

Places of storage and conservation of the valves must guarantee that they are not subject to knocks, drop impacts, deterioration or any other similar damages such to compromise the valve function.
The same precautions must be observed during the transport and handling phase of the pressure washers or wherever the valves have been installed.

ATTENTION:
The valves are supplied properly packed, unloading and handling of the apparatus must be handled by duly trained personnel .
Upon receipt of the valves, it is recommended to check the consignment and to note any type of damage caused during transport. Any eventual damage must be promptly communicated to the company PA srl for damage assessment.
Even during the assembly and installation phase of the valve, always proceed in a cautious manner during handling. Pay particular attention when handling in order to avoid knocks, and therefore any possible dents or deformation (especially the protruding openings) which could eventually determine leakages of the product contained in the apparatus to protect, through the fitting points of the valve.

2.1.2.Fixing and stability

ATTENTION:
The valve stability requirements on the apparatus must always be guaranteed by the assembler a/o user.

2.1.3.Installation and set up

The valve must be connected directly to the apparatus or by means of a piping system, free from interference by other appliances.
The connection diameters and discharge tubes of the valve have to be at least the same diameter of the valves threaded fitting and never to be handled during work.

Prior to use and testing on the valve:

- check for any damage to the valve
- check the correct position of the valve on the pressure washer.
- check that all connections to the machine/installation are carried out correctly.
- check the valve torque and all other machine components as well as the correct positioning of the gaskets.
- check that all safety, adjustment and control (including alarms) devices are correctly assembled and functioning (working order).
- foresee the final acceptance tests and examination (entire machine) including those expected from the Directive 97/23/CE.

2.1.4.Setup procedure

The SAFETY VALVE is set up by the manufacturer - the procedure done accordingly to regulation UNI EN ISO 4126-1 .

2.1.5.Cleaning

ATTENTION :
The cleaning functions are to be made frequently in line with running of the pressure washer and compulsory where there are evident signs of foreign bodies in the valve and discharges.

Before proceeding with the regular cleaning operations it is absolutely essential to discharge the internal pressure of the protected apparatus via special piping channelled in a safe area to avoid damages to persons or other; check the discharge phase through control devices (manometer). Therefore, disconnect all the service connections and empty completely the valve with all its contents. For internal and external cleaning always use non-inflammable or aggressive products, suitable for scrap removal, that do not damage the tank surface and are not noxious to the persons engaged in such operations.

ATTENTION:
Do not use for the cleaning operations any aggressive detergent chemicals a/o mechanical devices that can corrode, engrave or deform the valve.
For brass valves do not use nitrogenous or ammoniacal detergent solutions.

ATTENTION:
In order to prevent possible damaging to the valve in time it is advisable to empty the system completely, when not used for a certain period, and clean accurately together with
the valve.

2.1.6.Reinstallation a/o reutilization

Before reusing a/o reinstallation of the VALVE after cleaning and generic maintenance or any other necessary operation, put into effect the procedures in line with point 2.1

2.1.7.Demolition and disposal

The valve is fully composed of ferrous materials. Such materials are non-toxic or dangerous to the operators health and can be handled without particular precautions. In certain cases, it will be the operator to reasonably evaluate if eventual protective devices are necessary..

2.2. Utilization and functioning

The cautions to observe in course of exertion are in respective to the parameter controls of procedure and correct functioning.
Temperature and pressure of the product during working must never exceed the permissible max/min values TS and PS imprinted on the equipments plaque and on the present document.
Particular attention and care must be given to eventual leakage and to the opening/closing of the valve in case of an untimely and regular intervention.

2.2.1.Description of operations

The valve intervenes at the fixed set pressure and discharges the excessive water flow . By means of experimented tests it is proven and certified that within 10% of the set pressure value, the valve discharges the declared max flow rate.

2.2.2.Field of application

When correctly outlined the valve performs a protective function against the surmounting limits of acknowledged pressure of equipment in category 1, Directive 97/23/CE.

2.2.3.Expected utilization and non

ATTENTION:
Utilize correctly the valve within the set pressure limit and max/min permissible temperature quoted on the specific product technical manual. Do not use the valve for reasons different than the appropriated use determined on pt. 1.3
It is strictly forbidden to tamper with the valve and any type of improper use, in particular:

- modification of the relevant marking on the valve
- engrave, print or punch the valve body or any other internal/external VALVE component
- addition of welded parts or applications with rivets or screws
- carry out operations that can alter the mechanical properties of the material
- modifications on the VALVE at any time

The company PA srl declines any responsibility against damages to persons, animals or anything derived by an improper use of the apparatus a/o non compliance of the dispositions contained in the present instruction manual.

2.2.4.Operational and ambient limits

The functioning limits are indicated in the specific technical manual of the product.
In any case, there can be bad functioning of the valve even in the following circumstances:

- Failed revision

Keep to the revision schedule indicated specifically in the technical manual

- Polymerization or crystallization of the fluid

Avoid places of installation and utilization where temperatures are inferior to 0°C

- Valve partially opened during opening phase

It is forbidden to affix foreign bodies between the turns of the spring thus preventing a regular run

ATTENTION: Under no circumstance can the stable pressure of the protected apparatus be predictably guaranteed and for the valve under exerted pressure superior to the maximum permissible (PS), rated during the design phase in view also of the safety margins adopted.
It will be the installers a/o users attention to pertain carefully the directions on point 2.2.6.
Utilization is forbidden for void conditions and low temperature (< 0°C).

ATTENTION:
The apparatus must not be subject to consequent stress at low temperature (ice, cold, snow) and to similar ambient conditions (ex. weak installation or in a noxious atmosphere harmful for the set up materials)

2.2.5.Dangerous areas

Particular attention must be given, in presence of fluid in pressure, to the load and discharge connections of the fluid and work facilities.
ATTENTION:
It is strictly forbidden to work on the clamping elements and connections during the apparatus work phase and whenever each time it is foreseen in pressure.

2.2.6.Safety devices for safety, adjustment, control and warning

ATTENTION:
The pressure washer has to be equipped with a series of pressure and safety accessories as defined by the Directive 97/23/CE and corresponding to the norm CEI EN 60335-2-79 and prEN 1829 and UNI EN 764-7.
The valve indicated on the present document is a safety accessory and must function in an independent manner than from all the other safety, adjustment and control accessories.
The pressure washer has to be equipped with appropriate and efficient protection devices against surmounting of the limits imposed to the working temperature in correspondence to the Directive 97/23/CE, furthermore adequate means are necessary for the discharge and vent of the valve.
The outlet fitting of the safety valve must be connected to a tube constructed to allow the fluid discharge in safe conditions for the user. Such tube must not be intercepted.

ATTENTION:
At determined temperatures, the fluid contained in the pressure washer could produce directly to the user the risk of burns or for unexpected squirts not channelled or protected correctly during the assembly phase of the machine, therefore the assembler must use appropriate steps to protect and prevent risks of such type.

ATTENTION:
The Pressure washer must be equipped with a safety pressure switch or similar system as defined in the UNI EN 764-7.
The Pressure washer must be equipped with a pressure indicator or similar system as defined in the UNI EN 764-7.
The Pressure washer must be equipped with a temperature indicator or similar system as defined in the EN 764-7.
The Pressure washer must respond to the norm qualifications CEI EN 60335-2-79 e prEN 1829.

2.2.7.Unexcluded hazards and risks

· Excessive vibrations and impact stress

ATTENTION:
Higher stress other than those established by the norm CEI EN 60335-2 are not permitted, in particular when transmitted to the connection tubes of the gun lever and other connected apparatus (exchangers).
Where it is not possible to guarantee such conditions, appropriate measures are required to reduce to the minimum such exceptions, therefore a dampner is recommended.

- Back pressure

An elevated back pressure at discharge acts negatively on the valve not allowing the opening of the defined set up and consequently there is a a discharge flow reduction in respect to the declared values, therefore the discharge tube has to be free of back pressure (intake in the direction of the discharge flow is admitted).
The connecting tube to the valve must be as such in order to support the fluid flow without leading to excessive load loss.

· Heat source

ATTENTION:
THE VALVE MUST NOT BE EXPOSED TO FLAME OR ANY OTHER TYPE OF DIRECT HEATING (excluding an accidental external fire – see protection devices)
Safety valves submit an external surface temperature function of the fluid temperature wherever they work, the user has to evaluate , in line with the system temperatures taken, the necessity to use the attached DPI.

· Environment risks and for safety

ATTENTION:
The valve during the discharge phase a/o normal or irregular procedure, can send out noises superior to the limits foreseen from the DLgs 277/91 and subsequent modifications, therefore it is the users attention to value the overall exposure with respect to the installation site and pertain to the dispositions of the decree.

2.2.8.DPI and procedure (training)

The choice of the DPI to use on the machine are defined by the assembler or manufacturer of the same machine who must foresee also the training about the risks connected to the fluid used and the symptomatology caused by unexpected events.
The persons assigned to cleaning, maintenance, assembly, disassembly, control must be corectly instructed with regard to the surplus risks of the respective operations on the use of DPI a/o the correct manoeuvring implementation and reset conditioning of the valve.

2.3. CONDUCTION

2.3.1. Characterisitics of protection, adjustment and control devices

In no case can the valve stability have a guaranteed prediction for pressure strains superior to the maximum accepted, considered during design, in view also of the adopted safety margins. Therefore it will be the users responsibility to contemplate always the use of the pressure washer at excepted pressure nominal values and to control the other protective, adjustment, control devices.

In particular, it is necessary to correctly couple to the pressure washer the valve which has determined operative characteristics such as :

- Maximum flow rate discharge and flow rate to discharge (manouevring errors or external fire)

Permissible maximum pressure of the valve and apparatus to protect

- Pressure calibration of the device
-

The adjustment and control devices of the pressure washer must be independant from the protection devices.

The pressure indicators must be easily read , once installed on the apparatus, and refer clearly the indication of the permissible pressure limit. The temperature indicators must be easily read once installed on the apparatus and refer clearly the indication of the rated temperature. Particular attention must be given to the bottom part of the control devices reading scale, conform to national regulations and workmanlike.

2.3.2.Charge/discharge handling

The installation procedure of the valve must be as such to guarantee that the pressure washer is filled and emptied under safe conditions, in particular:

- The filling has to be made in absence of initial internal pressure.
- After having verified the regular procedure and absence of internal pressure, fill the pressure washer with the expected fluid avoiding rapid pressure risinf.
- During the draining phase for maintenance or cleaning it is necessary to establish that the connections are safe without any leaking.

ATTENTION :
Suitable means for draining and ventilation are foreseen in order to allow the operations of cleaning, inspection and maintenance in complete safety conditions.

2.3.3.Adjustment

Same rule as per the set-up pressures

ATTENTION:
In case of sudden opening of the protective device, bring to zero the pressure and proceed to the inspection phase, taking care in accurately cleaning from eventual fluid resin the devices connecting point and the device itself.
After the eventual intervention of the safety valve, it is necessary to check the re-closure of the safety device.

2.4.Precautions during inspection,ordinary maintenance,special,programmed

To proceed to the recurrent maintenance operations and cleaning it is necessary to discharge the internal pressure by means of a conduct channelled to a safe area avoiding damage to persons or things. Verify the discharge phase by means of the control devices (manometer).

The user has to ascertain that the operator is opportunely instructed so that he can carry out all safety and hygiene procedures on the worksite accordingly to the protocol, avoiding any risk resulting from the above mentioned operations.

2.4.1.Prohibition and reset of safety devices

ATTENTION:
During functioning it is strictly forbidden to tamper , block or bypass the safety devices.

The removal of the safety devices from the pressure washer is permitted exclusively for non pressurized apparatus and for the operations which verify the working order of the devices (ex: test bench calibration) or maintenance/replacement.
After re-installation of the safety devices , before restarting the apparatus in pressure, verify the tightness between the connection and the device and its working order (point 2.4.3.).

2.4.2.Replacement of parts and spares

The replacement of valve parts may not guarantee the design conditions established by PA srl, in particular if different springs are used other than those initially fitted. The declared operational characteristics are not guaranteed.
The valve has to be replaced at the users discretion, if the ordinary safety functions are no longer guaranteed.

2.4.3.Operational inspection of safety devices

Regarding the safety valve, it is necessary to verify the correct set pressure and eventual obstacles to the connection tubes and discharge.

2.5. Attached

- Specific technical product manual
- Declaration of conformity1