



# KOEPONNISTUSYKSIKKÖ FF 1515K

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**FINFINET OY**

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**KOEPPONNISTUSYKSIKÖN KÄYTTÖ- JA TURVALLISUUSOHJE****KÄYTTÖKUNTOON LAITTO**

1. Varmista korkeapaine liitokset.
2. Kiinnitä syöttövesiletku koneeseen. Varmista, että laite saa puhdasta vettä esteettömästi.
3. Varmista ennen sähkön kytkemistä, että moottorinsuojakytkin on OFF-asennossa
4. Avaa venttiili ja tarkasta, että vesi virtaa pumpun lävitse vesiverkoston paineella. Sulje venttiili.
5. Käynnistä kone kääntämällä moottorinsuojakytkin ON-asentoon.
6. Tarkista pumpun pyörimissuunta (pumpussa nuoli)
7. Laite on käyttökunnossa.
8. Korjaa vesivuodot välittömästi.
9. Ennen kuin aloitat mitään huoltotoimia, katkaise virta ja sulje vedentulo syöttövesiputkiston sulkuventtiilillä.
10. Yksikön korkeapaineletkussa on kaksi venttiiliä. Toinen koeponnistettavaan kohteeseen ja toinen paineen purkuun. Ennen purkuventtiilin avaamista käännä moottorinsuojakytkin asentoon OFF ja sulje veden syöttö. Purkuvesi on syytä johtaa letkulla viemäriin. Purkulinjaa ei saa kuristaa.

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**TEKNISET TIEDOT:**

- MITAT:       PITUUS       1160 mm  
                  LEVEYS       717 mm  
                  KORKEUS     950 mm

- PAINE:           500 bar  
- TUOTTO:         15 l/min  
- LÄMPÖTILA:     max 70 °C  
- TEHO:           15 kW  
- JÄNNITE:        400V, 50 Hz  
- NIMELLISVIRTA: 28 A  
- PAINO:          150 kg

**Sähköliitäntä: 16 A / 400 V**

**Vesiliitäntä: 1/2"**

- tuloveden max paine 10 bar
- min paine -0,3 bar
- tuloveden max lämpötila 70 °C

 **ÄLÄ KOSKAAN SUUNTAA VESISUIHKUA TOISTA  
IHMISTÄ TAI SÄHKÖLAITETTA KOHTI !!!!!**

**HUOLTO:**

**Ennen kuin aloitat mitään huoltotoimia, katkaise virta  
pääkytkimestä ja sulje veden tulo.**

- 1) Pumpun öljyt tulee tarkastaa kuukausittain. Öljynvaihto tulee suorittaa 50 ensimmäisen käyttötunnin jälkeen. Jatkossa 500 käyttötunnin tai vähintään puolen vuoden välein. Öljy BG 220 (SAE 90).**
- 2) Korkeapaineputkiston kuntoa on tarkkailtava ja pienetkin vuodot on korjattava välittömästi.**
- 3) Pumppujen vapaakiertoventtiilien toiminta on tarkastettava kahden kuukauden välein. Vapaakiertoventtiilit tulee huoltaa vuosittain.**

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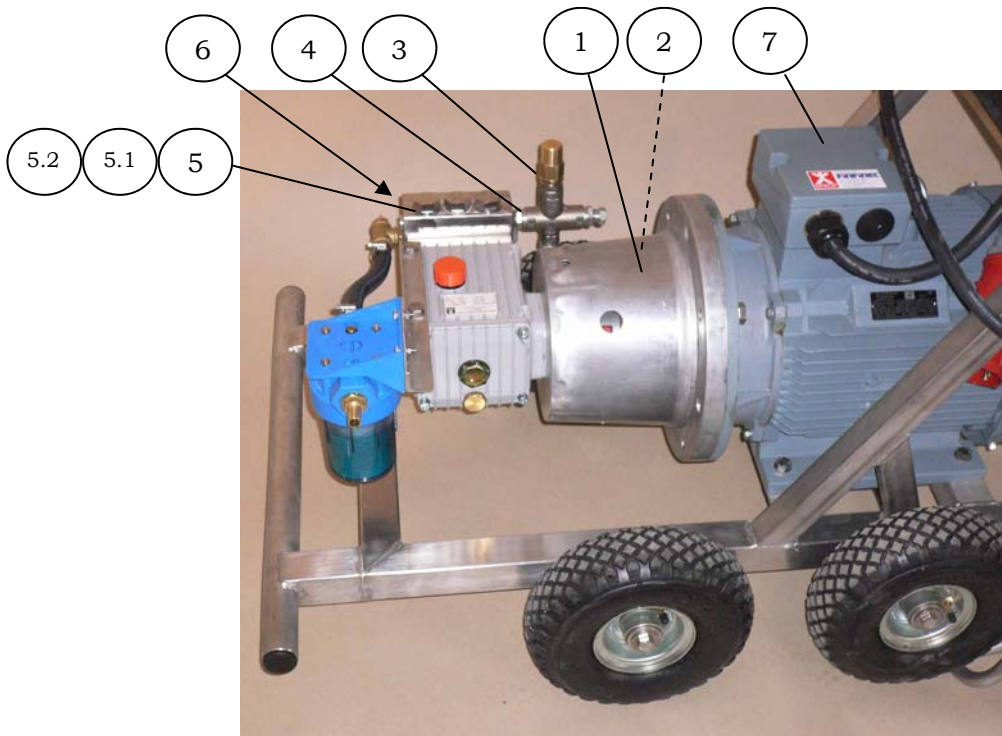
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| Nro. | Nimitys                                               | Til.Nro.  |
|------|-------------------------------------------------------|-----------|
| 1.   | Kytkentälaippa                                        | SP200168  |
| 2.   | Vetokytkin                                            | SP200211  |
| 3.   | Turvaventtiili VRP600                                 | P60540000 |
| 4.   | Kaksoisnipa ½"- ½"                                    | EC136-8   |
| 5.   | Korkeapainepumppu Speck NP25/15-500                   | SP005171  |
| 5.1. | Venttiilisarja                                        | SP140567  |
| 5.2. | Vesitiivistesarja                                     | SP140566  |
| 6.   | Lämpötilavahti VT6 ½"                                 | P60063070 |
| 7.   | Sähkömoottori DUTCHI DMI 160L-4 B35 15kW 1500rpm 400V |           |

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| Nro. | Nimitys                          | Til.nro.  |
|------|----------------------------------|-----------|
| 20.  | Pikaliitinrunko M22 – 3/8" s     | LKR12203S |
| 21.  | Pallohana PN500 3/8", purkulinja | VEGM2-G38 |
| 22.  | Pallohana PN500 3/8"             | VEGM2-G38 |
| 23.  | Korkeapaineletku L-5000 R2T      | E400      |
| 24.  | Letkukaluste 3/8" s              |           |
| 25.  | Letkukaluste 3/8" u              |           |
| 26.  | Painemittari 0..600 bar          | ID63-600T |

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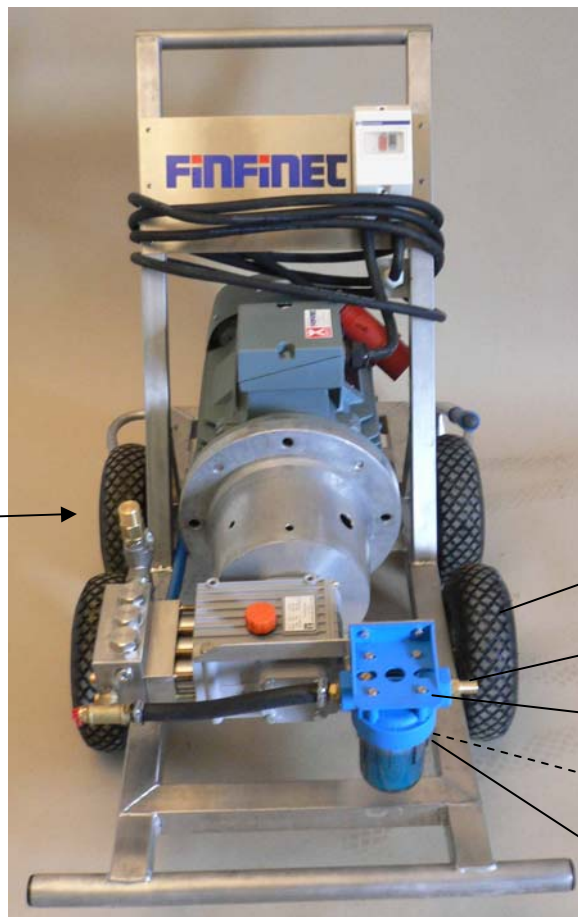
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| Nro. | Nimitys                                       | Til.Nro.   |
|------|-----------------------------------------------|------------|
| 27.  | Seinäteline                                   | STMBS      |
| 28.  | Suodatinpesä PR 5"                            | ST21560102 |
| 29.  | Suodatinpatruuna 5" 100mic                    | STSP5-100  |
| 30.  | Ilmakumipyörä 4.00-4 25/55 TV.KL ABC-KÄRRY OY |            |
| 31.  | Letkuliitin MESS 3/4X19                       | EA2932619  |
| 32.  | Käsiympyörä Turvaventtiili VRP600:Ile         |            |

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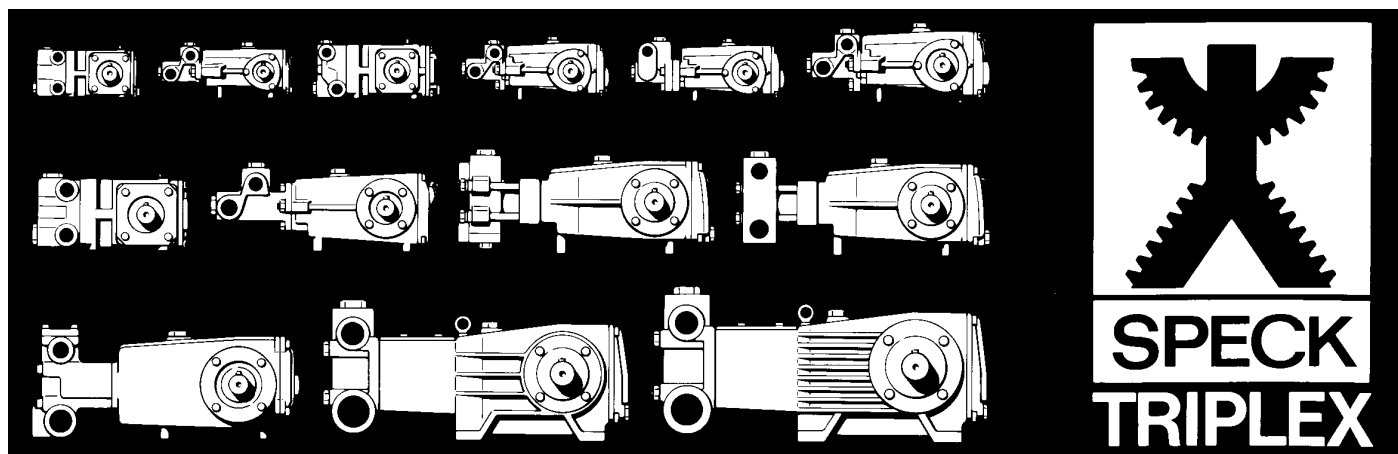
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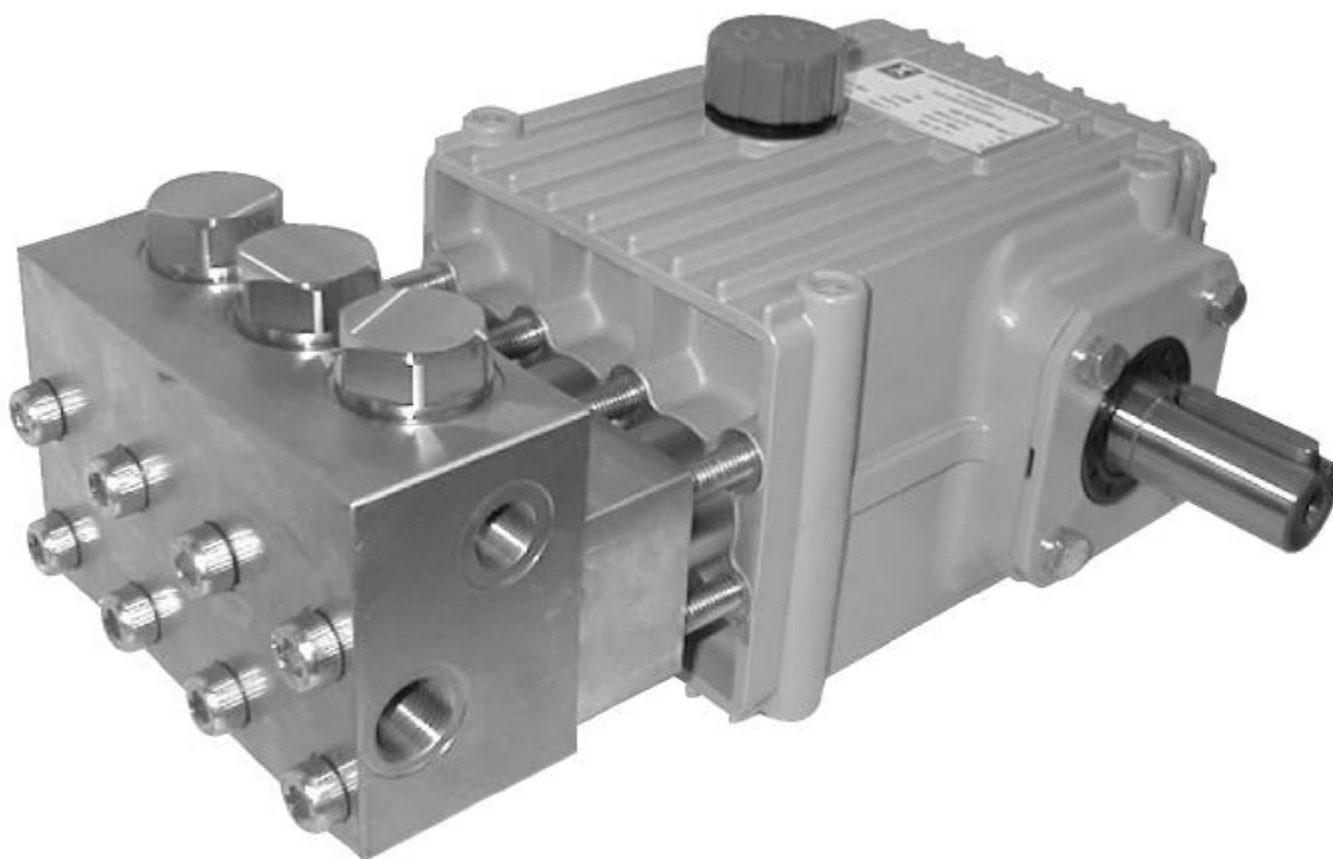
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**HOCHDRUCK-PLUNGERPUMPEN**  
**HIGH-PRESSURE PLUNGER PUMPS**

**BAUREIHE**  
**SERIES** **NP25**



| Type        | Best.-Nr. | Leistungs-<br>aufnahme | Überdruck<br>max. | Drehzahl<br>max.  | Förder-<br>menge<br>max. | Wasser<br>temp.<br>max. | Plunger<br>-Ø   | Hub    | Gewicht<br>ca.    | NPSHR            |
|-------------|-----------|------------------------|-------------------|-------------------|--------------------------|-------------------------|-----------------|--------|-------------------|------------------|
|             | Code No.  | Power<br>Consump.      | Pressure<br>max.  | RPM<br>max.       | Output<br>max.           | Water-<br>Temp.<br>max. | Plunger<br>dia. | Stroke | Weight<br>approx. | NPSH<br>Required |
|             |           | kW                     | bar               | min <sup>-1</sup> | l/min                    | °C                      | mm              | mm     | kg                | mWs              |
| NP25/12-500 | 00.5177   | 12.3                   | 500               | 1450              | 12.1                     | 40                      | 14              | 20     | 17.0              | -                |
| NP25/15-500 | 00.5171   | 14.8                   | 500               | 1450              | 14.5                     | 40                      | 14              | 24     | 17.0              | -                |

## Einsatzgebiete

SPECK TRIPLEX Plungerpumpen sind geeignet zur Förderung von sauberem Wasser oder anderen nicht aggressiven oder abrasiven Medien mit ähnlichem spezifischen Gewicht wie Wasser.

Vor dem Verpumpen anderer Fördermedien muß die Eignung und Beständigkeit der Pumpen in Standard oder Sonderausführung unter Berücksichtigung der Leistungs- und Temperaturwerte geprüft werden.

## Konstruktionsmerkmale

Die Pumpen der Baureihe NP25 zeichnen sich aus durch:

- Antriebsgehäuse aus stabilem Aluminiumguß.
- Kurbelwelle mit Zylinderrollenlager und Gleitlagerpleuel im Ölbad laufend.
- Plunger aus Vollkeramik.
- Doppelte Plungerabdichtung mit Leckagerückführung.
- Alle Dichtungen in Hülsen gehalten, dadurch exakte Zentrierung und erleichterter Austausch.
- Saug- und Druckventile baugleich, über Stopfen leicht zugänglich.

## Verwendete Werkstoffe

- Ventilgehäuse: Edelstahl 1.4313
- Plunger: Vollkeramik.
- Ventile: Hochfester Edelstahl.
- Manschetten: NBR mit Gewebeeinlage.
- Kurbelwelle: Gesenkgeschmiedet und einsatzgehärtet.

## Betriebsbedingungen

Trotz des pulsationsarmen Laufes der Pumpen muß von Fall zu Fall geprüft werden, ob ein Druckspeicher vorzusehen ist. Dies hängt im wesentlichen ab von der Konstruktion des Gerätes und von der Gesamtheit der Betriebsbedingungen. Die Funktion eines Druckspeichers kann auch von elastischen Druckleitungen übernommen werden. Besondere Sorgfalt ist bei Betrieb mit warmem Wasser erforderlich. Kavitation muß auf jeden Fall vermieden werden.

## Sicherheitsvorschriften und Garantie

Die Garantie beträgt 6 Monate nach VDMA.

Es ist ein Sicherheitsventil gemäß den "Richtlinien für Flüssigkeitsstrahler" vorzusehen, das so eingestellt ist, daß der Betriebsdruck um nicht mehr als 10% überschritten werden kann. Bei Nichteinhaltung dieser Vorschrift sowie bei Überschreiten der Temperatur- und Drehzahlgrenze erlischt jegliche Garantie.

## Fields of Application

SPECK TRIPLEX Plunger Pumps are suitable for pumping clean water and other non-aggressive or abrasive media with a specific weight similar to water.

Prior to pumping any other media, a check must be made to find out whether these pumps, taking pump performance and temperature values into consideration, are at all suitable for pumping the required medium.

## Construction Characteristics

Particular features of the NP25 series are:

- Crankcase of solid aluminium-cast.
- Crankshaft and cylinder roller bearings together with plain bearing con rod all run in oil.
- Solid ceramic plunger.
- Double plunger sealing with Leakage-return.
- All gaskets in seal sleeves ensuring precise centring and easy replacement.
- Identical suction and discharge valves, easily accessible.

## Materials Used

- Valve Casing: Stainless steel UNS J 91540.
- Plunger: Ceramic.
- Valves: High-Grade Stainless Steel.
- Sleeves: Nitrile with fabric reinforcing.
- Crankshaft: Drop-forged and case-hardened.

## Installation

Even though SPECK-TRIPLEX NP25 pumps run almost pulsation-free, there are cases where a pressure accumulator is necessary. This will depend mainly on the construction of the unit and the conditions under which it is operated. The same effect can also be achieved by using flexible pressure lines. In any case, use of a pulsation damper adds considerably to the life of the seals and bearings.

Particular care has to be taken when pumping warm water, making absolutely sure that cavitation can not occur.

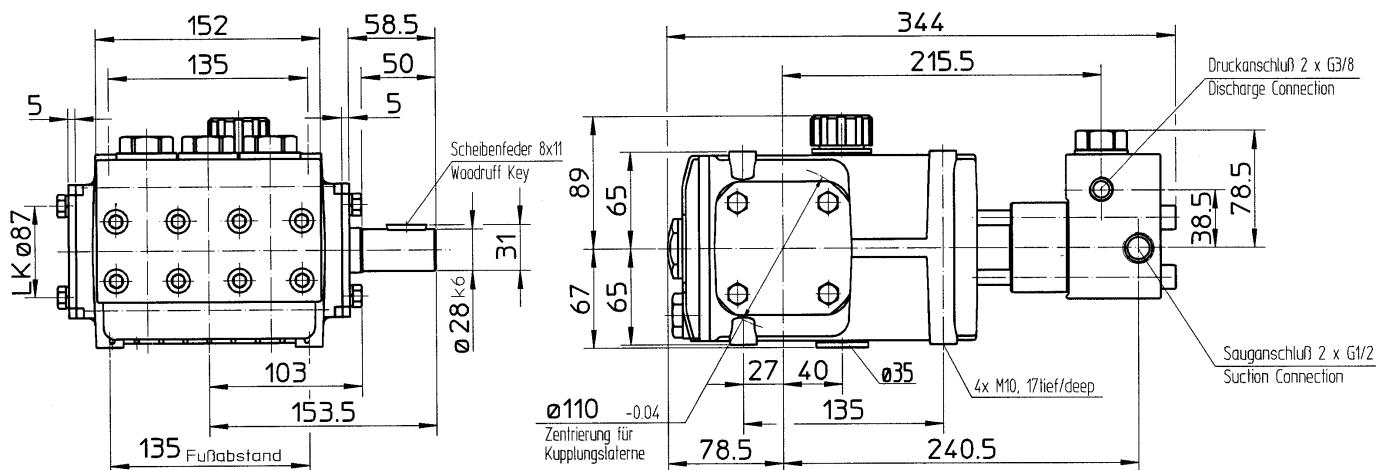
## Safety and Warranty Rules

There is a 6 month warranty in accordance with VDMA guidelines.

Pump operation without safety valve as well as any excess in temperature or speed limits automatically voids the warranty. The safety valve must be regulated in accordance with the guidelines for liquid spraying units so that the admissible operating pressure can not be exceeded by more than 10%.

NP25/12-500

NP25/15-500



## Leistungstabellen – Performance Table

|                                                                  |     |                                |                        |                     |                                 |                     |                                 |     |     |             |      |      |
|------------------------------------------------------------------|-----|--------------------------------|------------------------|---------------------|---------------------------------|---------------------|---------------------------------|-----|-----|-------------|------|------|
| Motorleistung in kW / Motor Performance KW<br><b>NP25/12-500</b> |     |                                |                        |                     |                                 |                     | Überdruck / Pressure            |     |     | max.        | 500  | bar  |
|                                                                  |     |                                |                        |                     |                                 |                     | Fördermenge / Output            |     |     | max.        | 723  | l/h  |
|                                                                  |     |                                |                        |                     |                                 |                     | Wassertemp. / Water Temp.       |     |     | max.        | 40   | °C   |
|                                                                  |     |                                |                        |                     |                                 |                     | Gewicht / Weight                |     |     | ca./approx. | 17.0 | kg   |
| Fördermenge                                                      |     | Pumpen-<br>drehzahl<br><br>RPM | Pumpen-<br>keilscheibe |                     | Motor-<br>keilscheibe           |                     | Druck in bar<br>Pressure in bar |     |     |             |      |      |
| Output                                                           |     |                                | Pump V-Belt<br>Pulley  |                     | Motor Pulley<br>bei/at 1450/min |                     |                                 |     |     |             |      |      |
| l/min                                                            | l/h |                                | Wirk-ø<br>Eff.Dia.     | Außen-ø<br>Ext.Dia. | Wirk-ø<br>Eff.Dia.              | Außen-ø<br>Ext.Dia. | 250                             | 300 | 350 | 400         | 450  | 500  |
| mm                                                               | mm  | mm                             | mm                     | mm                  | mm                              |                     |                                 |     |     |             |      |      |
| 8.3                                                              | 499 | 1000                           | 180                    | 186                 | 127                             | 133                 | 4.2                             | 5.1 | 5.9 | 6.8         | -    | -    |
| 9.1                                                              | 549 | 1100                           | 180                    | 186                 | 139                             | 145                 | 4.7                             | 5.6 | 6.5 | 7.5         | 8.4  | -    |
| 10.0                                                             | 599 | 1200                           | 180                    | 186                 | 151                             | 157                 | 5.1                             | 6.1 | 7.1 | 8.1         | 9.2  | 10.2 |
| 10.8                                                             | 648 | 1300                           | 180                    | 186                 | 165                             | 171                 | 5.5                             | 6.6 | 7.7 | 8.8         | 9.9  | 11.0 |
| 12.1                                                             | 723 | 1450                           | 180                    | 186                 | 180                             | 186                 | 6.2                             | 7.4 | 8.6 | 9.8         | 11.1 | 12.3 |
| Anzahl der Keilriemen Profil SPA*<br>Number of SPA V-Belts*      |     |                                |                        |                     |                                 |                     | 1 x SPA                         |     |     | 2 x SPA     |      |      |

|                                                                  |     |                     |                        |                     |                                 |                     |                                 |     |                     |      |      |         |     |
|------------------------------------------------------------------|-----|---------------------|------------------------|---------------------|---------------------------------|---------------------|---------------------------------|-----|---------------------|------|------|---------|-----|
| Motorleistung in kW / Motor Performance KW<br><b>NP25/15-500</b> |     |                     |                        |                     |                                 |                     | Überdruck / Pressure            |     | max. 500 bar        |      |      |         |     |
|                                                                  |     |                     |                        |                     |                                 |                     | Fördermenge / Output            |     | max. 868 l/h        |      |      |         |     |
|                                                                  |     |                     |                        |                     |                                 |                     | Wassertemp. / Water Temp.       |     | max. 40 °C          |      |      |         |     |
|                                                                  |     |                     |                        |                     |                                 |                     | Gewicht / Weight                |     | ca./approx. 17.0 kg |      |      |         |     |
| Fördermenge                                                      |     | Pumpen-<br>drehzahl | Pumpen-<br>keilscheibe |                     | Motor-<br>keilscheibe           |                     | Druck in bar<br>Pressure in bar |     |                     |      |      |         |     |
| Output                                                           |     |                     | Pump V-Belt<br>Pulley  |                     | Motor Pulley<br>bei/at 1450/min |                     |                                 |     |                     |      |      |         |     |
| l/min                                                            | l/h |                     | 1/min                  | Wirk-ø<br>Eff. Dia. | Außen-ø<br>Ext. Dia.            | Wirk-ø<br>Eff. Dia. | Außen-ø<br>Ext. Dia.            | 250 | 300                 | 350  | 400  | 450     | 500 |
| 10.0                                                             | 599 | 1000                | 180                    | 186                 | 127                             | 133                 | 5.1                             | 6.1 | 7.1                 | 8.1  | -    | -       |     |
| 11.0                                                             | 658 | 1100                | 180                    | 186                 | 139                             | 145                 | 5.6                             | 6.7 | 7.8                 | 9.0  | 10.1 | -       |     |
| 12.0                                                             | 718 | 1200                | 180                    | 186                 | 151                             | 157                 | 6.1                             | 7.3 | 8.6                 | 9.8  | 11.0 | 12.2    |     |
| 13.0                                                             | 778 | 1300                | 180                    | 186                 | 165                             | 171                 | 6.6                             | 7.9 | 9.3                 | 10.6 | 11.9 | 13.2    |     |
| 14.5                                                             | 868 | 1450                | 180                    | 186                 | 180                             | 186                 | 7.4                             | 8.9 | 10.3                | 11.8 | 13.3 | 14.8    |     |
| Anzahl der Keilriemen Profil SPA*<br>Number of SPA V-Belts*      |     |                     |                        |                     |                                 |                     | 1 x SPA                         |     | 2 x SPA             |      |      | 3 x SPA |     |

\* Die in den Tabellen gewählten PKS und MKS sowie das gewählte Keilriemenprofil dienen als Anhalt für die Antriebsauslegung.

Je nach Übersetzungsverhältnis können auch Motore mit anderen Drehzahlen und entsprechend geänderte MKS / PKS verwendet werden.

Zwischengrößen von Fördermenge / Drehzahl bzw. Druck / Menge / KW können durch lineare Umrechnung ausreichend genau bestimmt werden.

Allgemeine Formel zur Ermittlung des Kraftbedarfs:

$$\frac{P \text{ (bar)} \times Q \text{ (l/min)}}{475} = \text{kW}$$

\* The stated pump and motor pulley sizes as well as the V-belt model stated in the table serve as a guide in setting up the drive configuration.

Depending on the transmission ratio, motors with other speeds together with properly sized motor and pump pulleys can also be used.

Intermediate values for output / speed and pressure / output / kW can be established by linear extrapolation.

A general formula for calculating power is:

$$\frac{P \text{ (bar)} \times Q \text{ (l/min)}}{475} = \text{kW}$$



**SPECK Pumps (UK) Ltd**

11 - 12 Wycombe Industrial Mall · West End Street · High Wycombe · Bucks · HP11 2QY

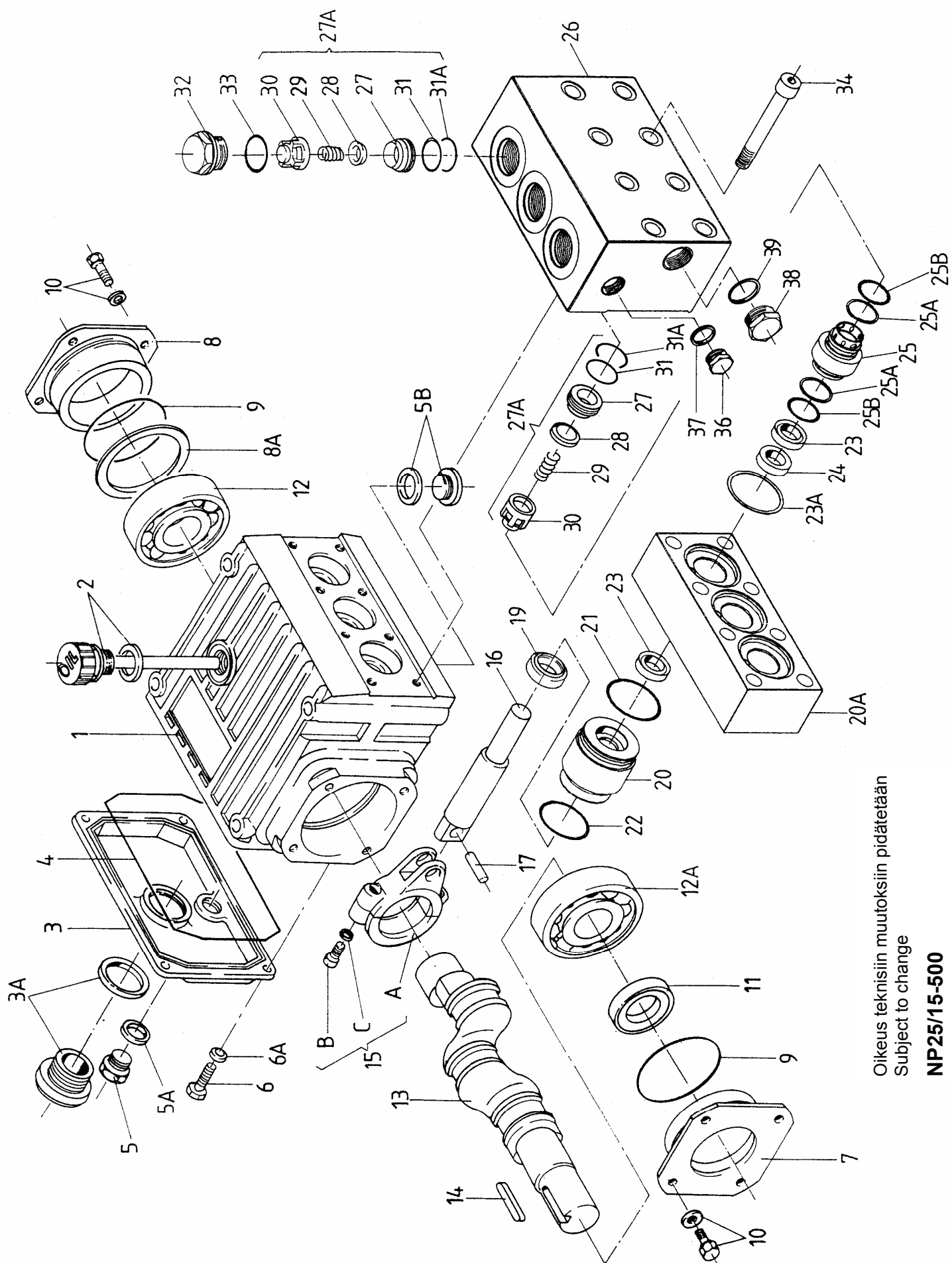
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[www.speck.co.uk](http://www.speck.co.uk)

| OsaNr.<br>Item No. | Kpl<br>No. Off | Tilausnro<br>Code No. | Nimitys                              | Description                   |
|--------------------|----------------|-----------------------|--------------------------------------|-------------------------------|
| 1                  | 1              | 01.0599               | Vaihteiston kuori                    | Crankcase                     |
| 2                  | 1              | 00.3090               | Öljytikku                            | Oil Dipstick Assy             |
| 3                  | 1              | 03.0243               | Takalaippa                           | Crankcase Cover               |
| 3A                 | 1              | 00.2416               | Öljysilmä                            | Oil Sight Glas Assy           |
| 4                  | 1              | 06.1005               | O-rengas                             | O-Ring                        |
| 5                  | 1              | 07.0705               | Tulppa G1/2                          | Plug G1/2                     |
| 5A                 | 1              | 06.0282               | Tiiviste G1/2                        | Gasket G1/2                   |
| 5B                 | 1              | 00.4510               | Tulppa ja tiiviste                   | Plug Assy                     |
| 6                  | 4              | 21.0026               | Sylinteriruuvi                       | Cylinder Screw                |
| 6A                 | 4              | 07.2994               | Aluslevy                             | Spring Washer                 |
| 7                  | 1              | 03.0255               | Laakerisuoja                         | Bearing Cover                 |
| 8                  | 1              | 03.0256               | Laakerisuoja                         | Bearing Cover                 |
| 8A                 | 1-3            | 07.3382               | Sovitelevy                           | Fitting Disc                  |
| 8B                 | 1              | 07.3392               | Sovitelevy                           | Fitting Disc                  |
| 9                  | 2              | 06.0058               | O-rengas                             | O-Ring                        |
| 10                 | 8              | 21.0034               | Kuusioruuvi                          | Hexagon Screw                 |
| 11                 | 1              | 06.0287               | Öljytiiviste                         | Radial Shaft Seal             |
| 12                 | 1              | 05.0172               | Kuulalaakeri                         | Cylinder Roller Bearing       |
| 12A                | 1              | 05.0112               | Kuulalaakeri                         | Cylinder Roller Bearing       |
| 13                 | 1              | 11.0626               | Kampiakseli                          | Crankshaft                    |
| 14                 | 1              | 07.3522               | Kiila                                | Fitting Key                   |
| 15                 | 3              | 00.2458               | Kiertokanki                          | Connecting Rod Assy           |
| 16                 | 3              | 00.4977               | Mäntäsarja                           | Plunger Assy                  |
| 17                 | 3              | 11.0739               | Ristipään tappi                      | Crosshead Pin                 |
| •19                | 3              | 06.1036               | Oljyiiviste                          | Seal                          |
| 20                 | 3              | 07.3539               | Tiivisteen sovite                    | Seal Adaptor                  |
| 20A                | 1              | 01.0784               | Tiivistepesä                         | Seal Casing                   |
| •21                | 3              | 06.0277               | O-rengas                             | O-Ring                        |
| •22                | 3              | 06.0846               | O-rengas                             | O-Ring                        |
| •23                | 6              | 06.1334               | Urarengas                            | Grooved Seal Packing          |
| •23A               | 3              | 06.1180               | Tukirengas                           | Support Ring                  |
| •24                | 3              | 07.3540               | Vesitiiviste                         | Guide Ring                    |
| 25                 | 3              | 07.3542               | Tiivistekotelo                       | Seal Case                     |
| •25A               | 6              | 06.1342               | Tukirengas                           | Support Ring                  |
| •25B               | 6              | 06.1373               | O-rengas                             | O-Ring                        |
| 26                 | 1              | 01.0778               | Venttiilipesä                        | Valve Casing                  |
| 27A                | 6              | 00.4993               | Venttiilisarja (27-31A)              | Valve Assy (27-31A)           |
| ••27               | 6              | 07.3577               | Venttiili-istukka                    | Valve Seat                    |
| ••28               | 6              | 07.3578               | Venttiililautanen                    | Valve Plate                   |
| ••29               | 6              | 07.2544               | Venttiilijouse                       | Valve Spring                  |
| ••30               | 6              | 07.2157               | Venttiilihäkki                       | Spring Tension Cap            |
| ••31               | 6              | 06.1164               | O-rengas                             | O-Ring                        |
| ••31A              | 6              | 06.1358               | Tukirengas                           | Support Ring                  |
| 32                 | 3              | 07.3332               | Tulppa                               | Plug                          |
| •33                | 3              | 06.0744               | O-rengas                             | O-Ring                        |
| 34                 | 8              | 21.0527               | Kuusioruuvi                          | Hexagon Screw                 |
| 36                 | 1              | 07.3350               | Tulppa G3/8                          | Plug G3/8                     |
| 37                 | 1              | 06.1082               | Kuparitiiviste                       | Copper Washer                 |
| 38                 | 1              | 07.0705               | Tulppa G1/2                          | Plug 1/2                      |
| 39                 | 1              | 06.0620               | Kuparitiiviste                       | Copper Washer                 |
|                    | 1              | 00.5179               | Vaihteistosarja (1-22/ ilman 20A/34) | Gear Assy (1-22/ w/o 20A/34)  |
|                    | 1              | 00.5178               | Pumppupääsarja (26-39 ilman 34)      | Pump Head Assy (26-39 w/o 34) |
|                    | 1              | 00.5065               | Tiivistekotelosarja (20A/23-25B)     | Seal Case Assy (20A/23-25B)   |
| •                  | 1              | 14.0566               | Tiivistesarja                        | Seal Repair Kit               |
| ••                 | 1              | 14.0567               | Venttiilisarja                       | Valve Repair Kit              |

Tilattaessa ilmoita tilausnumero, pumpun malli sekä sarjanumero.  
When ordering please state Code No., Pump Model and Pump Serial No.



Oikeus teknisiin muutoksiin pidätetään  
Subject to change

**NP25/15-500**

## VRP600 – Safety and pressure regulating valve Aisi 303

Technical manual: E 249

Compensated pressure regulating valve.  
Regulates the bypass of the fluid with a minimum variation of the pressure.  
Suitable to be utilized as a safety valve on pressure washers.

DN 15



- **60.5400.00** VRP600 G1/2 560 bar – 56 MPa

- Sturdy construction in Sst Aisi 303
- Return action of the piston by means of a powerful spring, for a secure function and reliable pressure adjustment.
- Multiple connections for quick installation

### AS SAFETY VALVE ONLY FOR PRESSURE WASHERS

- Reliable intervention discharging all the flow.
- Prompt and effective damping action against pressure spikes.

### AS A PRESSURE REGULATING VALVE

- High balancing to guarantee slight variations of the rated pressure when the flow varies in bypass.
- Usable with a multiple number of lances.

### TECHNICAL SPECIFICATIONS

Max. flow rate 80 l/min - Max. temperature 90°C (1)

| Part number | Rated pressure<br>bar - MPa | Permissible pressure<br>bar - MPa | Minimum adjustable pressure<br>bar - MPa | (2) Pressure increase<br>as a VS – as a VRP<br>bar – Mpa - bar - MPa | Inlet<br>Outlet | Bypass   | Weight<br>g |
|-------------|-----------------------------|-----------------------------------|------------------------------------------|----------------------------------------------------------------------|-----------------|----------|-------------|
| 60.5400.00  | 560 - 56                    | 600 - 60                          | 56 – 5.6                                 | 51 – 5.1 - 31 – 3.1                                                  | G 1/2" F        | G 1/2" F | 840         |

(1) The valve has been designed for a continuous use at a water temperature of 60°C. It can resist for short periods at a maximum temperature of 90°C.

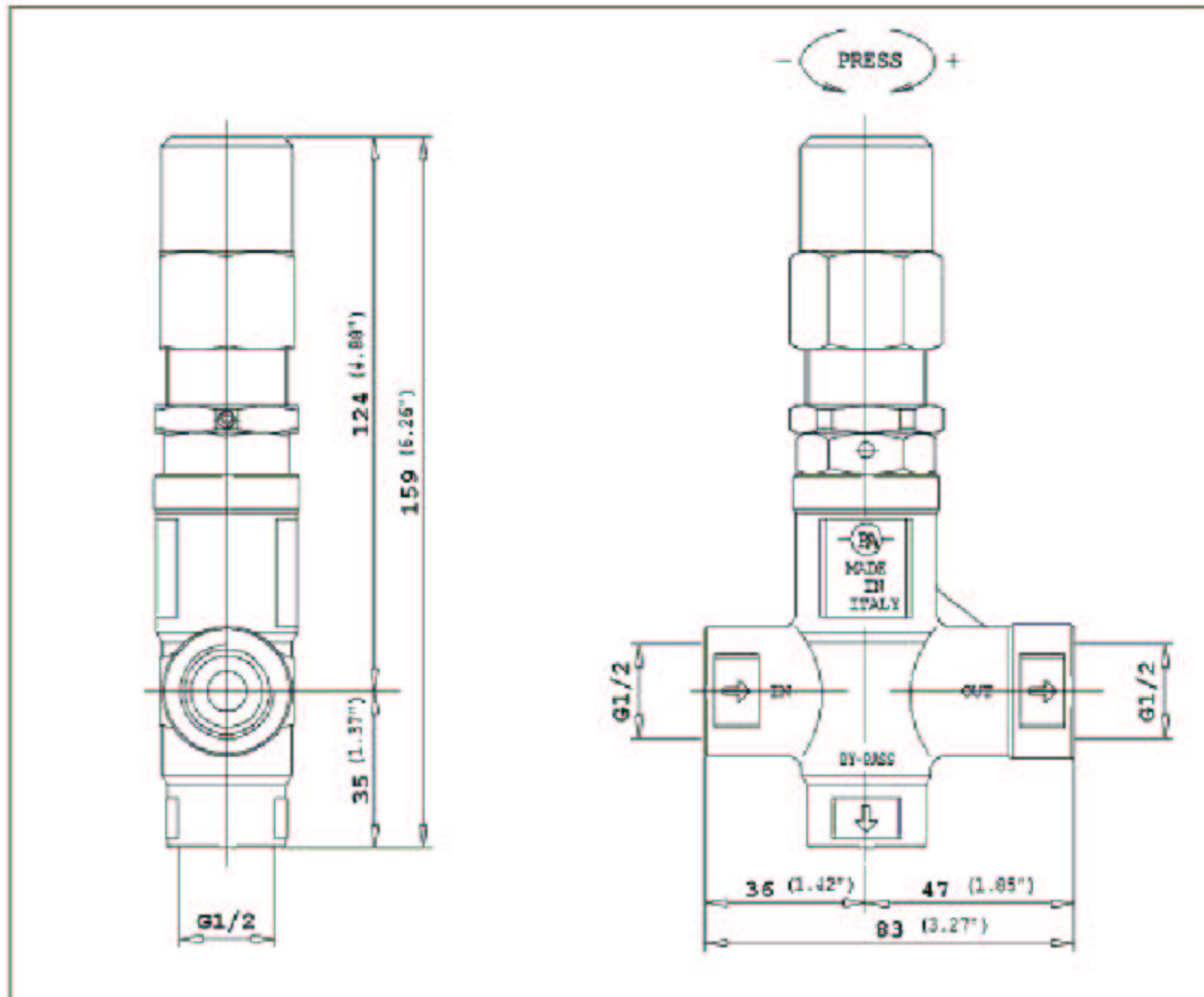
(2) **Pressure increase** = is the increase of pressure needed into the valve for discharging the max. flow when utilized at rated pressure

**Instruction manual, maintenance, installation, spare parts.**  
For a correct utilization, follow the directions of this manual  
**Re-print them on the use and maintenance booklet of the machine.**

n. 12.9249.00

Rev. 01  
01/09/03

## DIMENSIONAL DRAWING.



## INSTRUCTIONS

### SELECTION

This product is to be utilized with clean fresh water, even slightly additivated with normal detergents. For use involving different or corrosive liquids, contact the PA Technical department. Choose the valve in line with the data of nominal running (system rated pressure, max flow and max temperature). In any case, the pressure of the machine should not exceed the permissible pressure rate imprinted on the valve. When in use as pressure regulator, adopt a nozzle that allows a bypass of at least 5% of the total flow, bearing in mind that a worn out nozzle causes pressure loss. The valve, assembled in line with these indications, avoids pressure spikes whilst the machine is in operation.

### INSTALLATION

This accessory, on a system that produces hot water, must be fitted **in front of the heat generator**.

As a SAFETY VALVE: in the case when frequently combined with unloader valves and low pressure in the pump, it has to be fitted in the section that remains pressurized when the gun is shut off.

As a PRESSURE REGULATOR: maintains the pressure in the system steady during flow changes. **Always** install with the correct specifications when combined with a safety valve. In case of discharge in the tank or directly into the pump, it is necessary to provide devices capable to prevent damaging turbulence to the liquid flow.

### OPERATIONS

The discharge should be returned to a baffled tank. If, on the contrary, the pump is fed directly from the water mains, it is advisable to install a pressure reducing valve, before the pump, to avoid dangerous pressure spikes which could badly damage manifolds and suction valves. In case of extended conditions of bypass directed to the suction side of the pump, it is recommended to install a thermal valve (VT3 or VT6) to avoid dangerous water temperature build-up.

### PRESSURE ADJUSTMENT/SETTING

As a SAFETY VALVE: the adjustment has to be made in such a way that the pressure setting is not superior to the system working pressure and its accessories; this prevents the arisal of numerous pressure increases in hot water systems and static pressure (gun shut off).

As a PRESSURE REGULATOR: adjust the valve when the system is pressurized and the gun open. The operation will be easy and smooth if the proper nozzle is chosen. When rotating the adjustment knob, it has to correspond to a consequent pressure increase; should the pressure stop increasing before reaching the desired value, **do not insist**, but check the correct nozzle size in relation to flow and pressure. On reaching the desired pressure, tighten the nut (pos 22) with a drop of paint in order to emphasize any tampering or slackness.

## PROBLEMS AND SOLUTIONS

| PROBLEMS                                    | PROBABLE CAUSES                                                                                                                                                        | SOLUTIONS                                                                                                                      |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Valve cycles                                | <ul style="list-style-type: none"> <li>- Air inside the system</li> <li>- Worn out seals</li> <li>- Clogged circuit</li> </ul>                                         | <ul style="list-style-type: none"> <li>- Flush out</li> <li>- Replace</li> <li>- Clean or widen passages</li> </ul>            |
| The valve does not reach pressure           | <ul style="list-style-type: none"> <li>- Incorrect nozzle size</li> <li>- Seat/shutter/ball worn out</li> <li>- Damaged nozzle</li> <li>- Impurities</li> </ul>        | <ul style="list-style-type: none"> <li>- Modify</li> <li>- Replace</li> <li>- Replace</li> <li>- Clean</li> </ul>              |
| Pressure drop                               | <ul style="list-style-type: none"> <li>- Worn out nozzle</li> <li>- Pump gaskets worn out</li> <li>- Valve seat worn out</li> <li>- Air inside the system</li> </ul>   | <ul style="list-style-type: none"> <li>- Replace</li> <li>- Replace</li> <li>- Replace</li> <li>- Flush out</li> </ul>         |
| Pressure spikes                             | <ul style="list-style-type: none"> <li>- There is not a min.5% of total flow in bypass</li> <li>- Clogged nozzle</li> <li>- Adjustment with squashed spring</li> </ul> | <ul style="list-style-type: none"> <li>- Re-adjust</li> <li>- Clean</li> <li>- Repeat adjustment and replace nozzle</li> </ul> |
| Water leakage from bypass<br>Valve pounding | <ul style="list-style-type: none"> <li>- O-ring seat damaged</li> <li>- Damaged seat</li> <li>- Impurities or worn out valve pumps</li> </ul>                          | <ul style="list-style-type: none"> <li>- Replace</li> <li>- Replace</li> <li>- Clean</li> </ul>                                |

## REGULATIONS : *see norm manual*

The accessory hereby described bears the CE marking in accordance with the Norms and Directives applied on the Declaration of conformity.

For a correct utilization, follow the directions described in this manual and re-print them on the Use and maintenance manual of the machine.

Make sure that you are given **the Original Conformity Declaration** for the accessory chosen. The present manual is valid for all unloader valves named **VRP 600**.

## MAINTENANCE

Maintenance has to be carried out by **Specialized Technicians**.

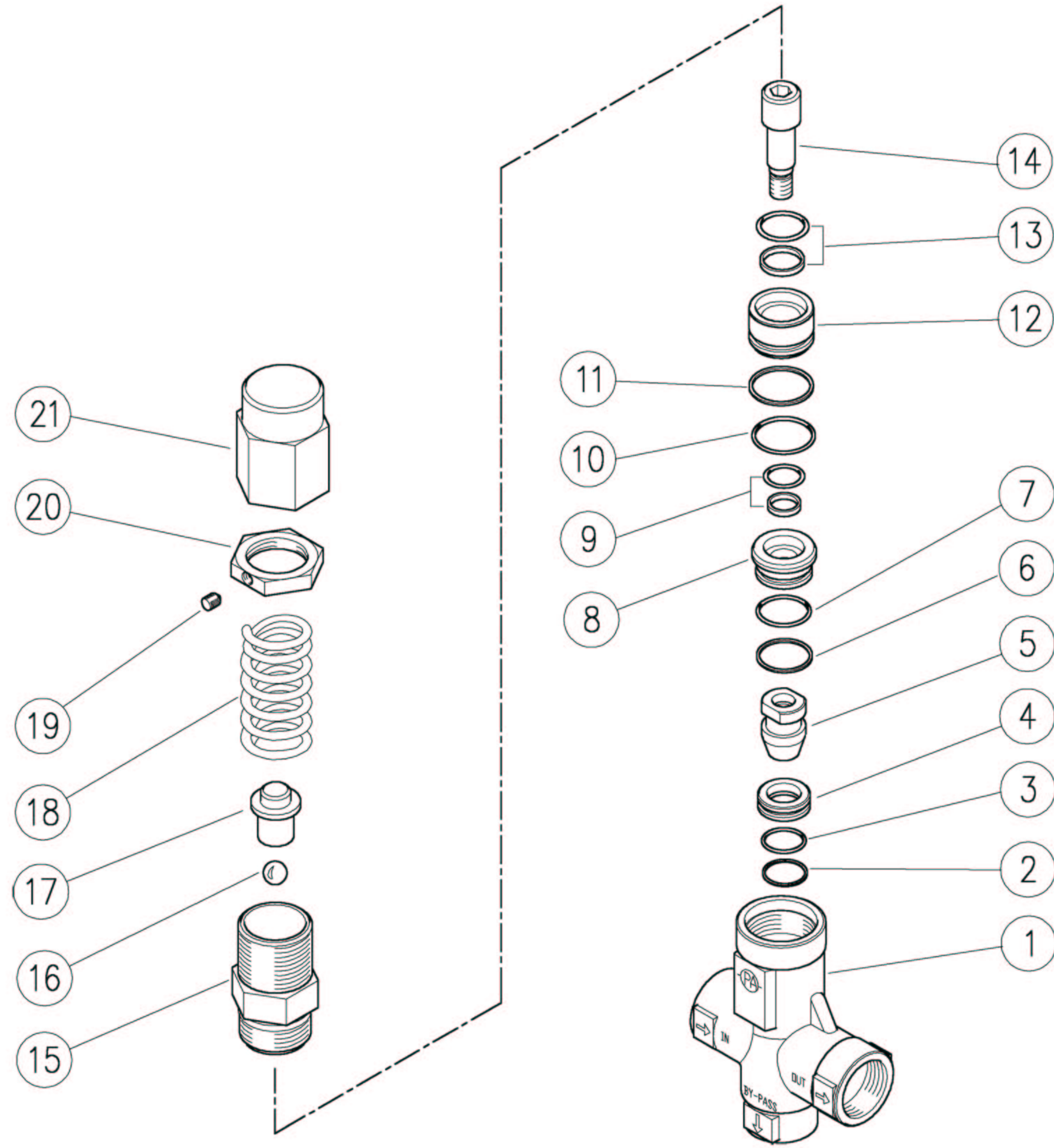
**STANDARD:** every 400 working hours (circa 10,000 cycles), check and lubricate the seals with water resistant grease.

**SPECIAL:** every 800 working hours( circa 20,000 cycles), control the wear of the seals and internal parts and if necessary, replace with original PA parts taking care during installation and to lubricate with water resistant grease.

**ATTENTION:** reassemble the valve in the correct manner paying special attention how to set the valve as described in the paragraph **PRESSURE ADJUSTMENT/SETTING**.

The manufacturer is not to be considered responsible for damage as a result from incorrect fitting and maintenance.

Technical data, descriptions and illustrations are indicative and liable to modification without notice.



| Pos. | P/N        | Description                            | Q.ty | K1 | K2 | K3 | K4 |    |
|------|------------|----------------------------------------|------|----|----|----|----|----|
| 1    | 60.5401.55 | Housing -VS23-VRP/P600, 1/2F Bsp brass | 1    |    |    |    |    | 1  |
| 2    | 10.4036.17 | Back-up ring, 14x2x17x1,5 mm           | 1    | •  |    |    |    | 10 |
| 3    | 10.3064.01 | O-ring, 1,78x14 mm Ni 85               | 1    | •  |    |    |    | 10 |
| 4    | 60.5404.51 | Seat, 9,2x17x7,5 mm Sst.               | 1    | •  |    |    |    | 5  |
| 5    | 60.5403.51 | Shutter pin, M7 Sst.                   | 1    | •  |    |    |    | 3  |
| 6    | 10.4039.00 | Back-up ring, 15,7x18,5x1,5 mm         | 1    | •  |    |    |    | 10 |
| 7    | 10.3066.01 | O-ring, 1,78x15,6 mm Ni 85             | 1    | •  |    |    |    | 10 |
| 8    | 60.5410.51 | Lower spacer ring, 8x21,4x11,5 mm Sst. | 1    |    |    |    |    | 3  |
| 9    | 10.2008.00 | Stem seal, 8x13x2,2 mm +O-ring         | 1    | •  |    |    |    | 5  |
| 10   | 10.3070.02 | O-ring, 1,78x18,77 mm Ni 85            | 1    | •  |    |    |    | 10 |
| 11   | 10.4057.00 | Back-up ring, 18,7x21,5x1,5 mm         | 1    | •  |    |    |    | 10 |
| Kit  | P/N        | Description                            |      |    |    |    |    |    |
| K1   | 60.5411.24 | Spares kit -VRP/P 600, 10x1pcs.        |      |    |    |    |    | 1  |

| Pos. | P/N        | Description                            | Q.ty | K1 | K2 | K3 | K4 |    |
|------|------------|----------------------------------------|------|----|----|----|----|----|
| 12   | 60.5409.51 | Upper spacer ring, 8,3x21,5x17 mm Sst. | 1    |    |    |    |    | 3  |
| 13   | 10.2013.00 | Stem seal, 12x17x2,2 mm +O-ring        | 1    | •  |    |    |    | 5  |
| 14   | 60.5408.51 | Piston, M7 Sst.                        | 1    |    |    |    |    | 5  |
| 15   | 60.5407.51 | Piston holder, Sst.                    | 1    |    |    |    |    | 5  |
| 16   | 14.7443.10 | Ball, 11/32" Sst.                      | 1    |    |    |    |    | 10 |
| 17   | 60.5406.31 | Spring rest pin, brass                 | 1    |    |    |    |    | 3  |
| 18   | 60.5402.61 | Spring, 5,4x22x64,5 mm z.pl.           | 1    |    |    |    |    | 3  |
| 19   | 16.2100.00 | Set screw, DIN914 M4x4 mm              | 1    |    |    |    |    | 10 |
| 20   | 60.1814.31 | Ring nut, M27x1 brass                  | 1    |    |    |    |    | 5  |
| 21   | 60.5405.31 | Valve regulating ring nut, M27x1 brass | 1    |    |    |    |    | 3  |