

Affordable Strategic Parts



Edition 2015  
**PRODUCTS CATALOG**



# **APSON Products Catalogue 2015**

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## **APSON Products Catalogue 2015**

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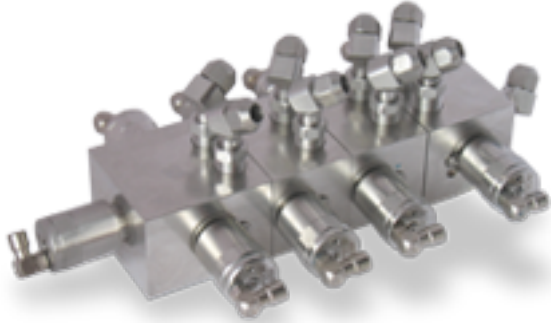
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# **Part I. APSON Lacquer Changers**

## **1. APSON Lacquer Changers**



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# Overview

APSON offers a variety of industrial Paint Changer Types. All can be equipped by means of Deadspacefree Valve Technology, have a high throughput, and are well rinseable. They are suitable for liquid aggressive media, e.g. standard and metallic paints, solvents, alkalis.

## Selection Guide

APSON Lac- quer Changer ..	Blocks	Outlet Channels	Valves per Block
<b>LCS-2000 Standard</b>	> 35	1, 2 or 3	Max. 2, 4 or 6
<b>LCC-2007 Compact</b>	Max. 4	1	Max. 6
<b>LCN-2008 Newteable</b>	> 35	1	Max. 2
<b>LCM-2010 Mini</b>	> 35	1	Max. 2
<b>LCLT-20K4</b>	> 23	4	Max. 4
<b>LCLT-25K4</b>	> 23	4	Max. 4

Special lacquer changers according to customer specifications are available on request.

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# Lacquer Changer LCS-2000 Standard

## 1. Introduction

The **APSON Lacquer Changer LCS-2000 Standard** is particularly suitable for applications in automatic systems with chemically aggressive media, e.g. lacquers, solvents, caustic solutions, a.o. Due to the construction and the large throughput it is very good rinsable and usable both for normal lacquers and metallic lacquers. Furthermore, this type of lacquer change-over switch can be also used as rinsable distributor (one inlet, several outlets) or as rinsable concentrator (several inlets, one outlet).

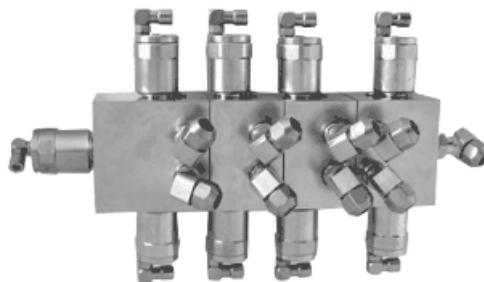
## 2. Features

The APSON LCS-2000 has the following capability characteristics:

- environmental carefully due to short rinsing times
- cost-saving due to minimized medium consumption
- high throughput and very good rinsing barness
- simplest handling when assembling and at maintenance
- very compactly and suitably for close spatial relations
- deadroom-free valves, and rinsing and throughput-optimized medium channels
- consists of inoxidable steel, thus durably and corrosion resistant
- insensitive to caustic solutions and weak acids
- scalable for the desired number of input media

## 3. Structure and Function

The APSON LCS-2000 is standardly made of inoxidable steel.



APSON LCS-2000 with cleaner block

It consists of:

- A selectable number of lacquer changer switch blocks.
- A final lacquer changer switch block for the medium outlet.
- An exchangeable APSON Pulse Cleaner or APSON Turbo Cleaner.

The lacquer changer switch blocks have a seal at each end of the output channel for sealing the neighbouring blocks as well as two pins each for centering the blocks when assembling the lacquer changer. Each block has two screwable sockets for pneumatically controllable APSON 2/2-Ways Lacquer Valves 200x.

During the rinsing cycle, the cleaner feeds several times alternating for short periods solvent and air into the central channel.

Per block, maximal two channels can be independently connected through to the central channel. The lacquer changer is preferentially installed with the cleaner block at the top.

## 4. Technical Data

Denomination	APSON LCS-2000
Media	Lacquers, solvent, caustic solutions, a.o.
Medium pressure	max. 12 bar
Valve assembly	2/2-ways lacquer valves for branch lines or constant medium circulation (see Options)
Materials	Inoxidable steel
Seals	Viton™, or on customer's request
Medium inlets	for hose D = 8 mm, d = 6 mm (or on customer's request)
Medium outlets	for hose D = 8 mm, d = 6 mm (or on customer's request)
Dimensions of one block (LxWxH)	<ul style="list-style-type: none"> <li>• without valves: 70 mm x 45 mm x 40 mm</li> <li>• with valves: 150 mm x 45 mm x 40 mm</li> </ul>
Mass	approx. 400 g per lacquer change-over switch block

## 5. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Changer Block LCB-2000, without cleaner	050-Axxx
APSON Pulse Cleaner PC-2000 (standard cleaner)	070-A005
APSON Turbo-Pulse Cleaner TPC-2001 (alternative cleaner)	070-A002
APSON Turbo Cleaner TC-2002 (alternative cleaner)	070-A004
APSON 2/2-Ways Lacquer Valve LV-2000-2.2 (sparepart)	060-A008

### Options:

- Connection for ring circuit with constant medium circulation.

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# Lacquer Changer LCC-2007 Compact

## 1. Introduction

The **APSON Lacquer Changer LCC-2007 Compact** is particularly suitable for applications in systems with close spatial relations, e.g. robots, and in automatic systems for the processing of often to change chemically aggressive media, e.g. lacquers, solvents, caustic solutions, a.o. Due to the construction and the large throughput it is very well rinsable and applicable both for normal lacquers and metallic lacquers.

**The compactness results because all hoses lead bundled on a within seconds unscrewable interface.**

## 2. Features

The **APSON LCC-2007** has the following capability characteristics:

- Environmental carefully due to short rinsing times.
- Cost-saving due to very small consumption of cleaner medium.
- High throughput and very good rinsing barness.
- Simplest handling at assembling, maintenance and valve exchange.
- Fast exchange of the complete lacquer changer (approx. 3 minutes).
- Particularly suitable for close spatial relations (robots).
- Deadthroom-free valves and optimized media channels for rinsing and throughput.
- Visible switching status of the valves.
- Bundled tubes routing (no tubes in the space).
- Proactive maintenance possible due to leakage display of the valves.
- Scalable, one to four valve blocks with in each case one to six valves.

## 3. Structure

The **APSON LCC-2007** has an integrated cleaner with 2 valves, is modular expandable for max. 22 lacquer valves and has a central output channel. As valves both APSON 2/2-ways valves for standard applications and APSON 3/2-ways valves for special applications are applicable.



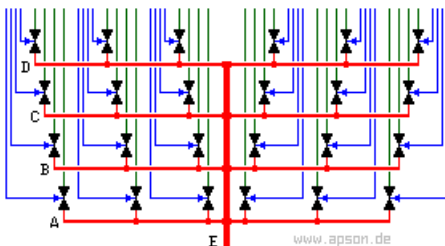
APSON LCC-2007

The **APSON LCC-2007** consists of:

- An interface for the pneumatic tubes and the inlets and outlets for the media.
- Max. four valve blocks with in each case six radially arranged screwable sockets for APSON 2/2-ways or APSON 3/2-ways needle valves.

## 4. Function

The **APSON LCC-2007** is pneumatically controllable.



Depending upon execution and valve assembly the following applications are possible:

- Applications with 2/2-ways valves and media branch tubings.
- Applications with 2/2-ways valves and constant media circulation.
- Applications with 3/2-ways valves (media circulation alternating with media pass through).

## 5. Technical Data

Denomination:	APSON LCC-2007
Media:	Lacquers, solvent, caustic solutions, a.o.
Medium pressure:	max. 12 bar
Valve assembly:	<ul style="list-style-type: none"> <li>• 2/2-ways valves for branch tubings or constant media circulation</li> <li>• 3/2-ways valves for media circulation alternating with media pass through</li> </ul>

Control air pressure:	min. 6 bar upto max. 8 bar, measured on the valve
Materials:	<ul style="list-style-type: none"> <li>• medium-touching sections from inoxidable steel or hard coated aluminum</li> <li>• interface disk and union nut from hard coated aluminum</li> </ul>
Seals:	Teflon™, Viton compound™, or on customer's request
Control air connection:	for tube 4 x 2.7 mm, (before the interface reduced to 3 x 2 mm)
Media inputs:	for tube 6 x 4 mm
Medium output:	Screwable connection G1/4", for tube 6 x 4 mm
Dimensions:	<ul style="list-style-type: none"> <li>• without valves: ø110 mm, height 420 mm</li> <li>• with valves: ø125 mm, height 420 mm</li> </ul>
Mass:	Aluminum approx. 5 kg, inoxidable steel approx. 14 kg

## 6. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Changer LCC-2007 Compact, up to 24 valves (max. 22 lacquer valves and 2 valves for the integrated cleaner)	050-A001

### Options:

- Medium-touching sections made of aluminum or inoxidable steel, depending upon customer's request
- Alternative valve assembly; 3/2-ways valves for media circulation alternating with media pass through

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# Lacquer Changer LCN-2008 Newteable

## 1. Introduction

The **APSON Lacquer Changer LCN-2008 Newteable** pertains to the class of media changers with media recovery.

Normal media changers and media distribution systems must be rinsing cleaned before switching to a new medium. The surplus of media in such systems must be collected and be recycled at expensive monetary costs and environmental duties.

The APSON LCN-2008 consists of newtable valve switching blocks and allows full regain of the media through push-back of the media from the transportation tubes and lacquer changers into the media supply system. It offers large throughput of the medium and due to the construction and employed technology with deadroom-free APSON Lacquer Valves allows very good rinsing of the lacquer changer in conjunction with the media supply tubes and also the media output tubes.

The APSON LCN-2008 is well suited for employment in automatic systems with chemically aggressive media, e.g. lacquers, solvents, caustic solutions, a.o. Furthermore this type of lacquer changer can be also used as rinsable distributor (one inlet, several outlets) or as rinsable concentrator (several inlets, one outlet). It is usable both for normal lacquers and metallic lacquers.

## 2. Features

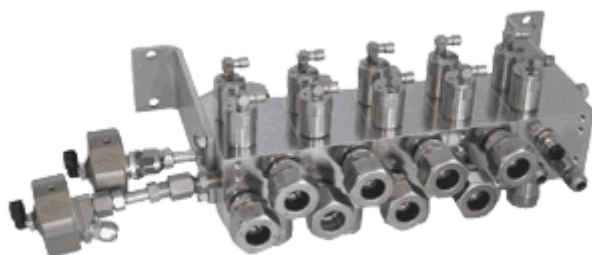
The APSON LCN-2008 has the following capability characteristics:

- Environmental carefully due to the regain of the lacquer media and short rinsing times.
- Cost-saving due to minimized medium consumption.
- High throughput and very good rinsing barness.
- Simplest handling when assembling and at maintenance.
- Very compact and suitable for close spatial relations.
- Deadroom-free valves and rinseing- and throughput-optimized medium channels.
- Consists of inoxidable steel, thus durably and corrosion resistant.
- Insensitive to caustic solutions and weak acids.
- Scalable for the desired number of media.

## 3. Structure and Function

The APSON LCN-2008 consists of:

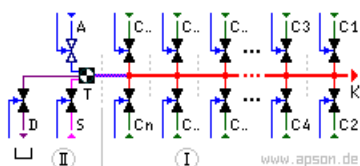
- A selectable number of medium change-over switch blocks.
- A final medium change-over switch block for the medium outlet.
- An exchangeable APSON Pulse Cleaner or APSON Turbo Cleaner.



APSON LCN-2008 with APSON Cleanerblock

Each switching block has two screwable sockets for pneumatically controllable APSON 2/2-Ways Lacquer Valves LV-200x. Thus, per block, maximal two channels can be independently connected through to the central channel. The switching blocks have a seal at each end of the output channel for sealing the neighbouring blocks as well as two pins for centering the blocks when assembling the lacquer changer. The component parts are made of inoxidable steel.

During the rinsing cycle, the cleaner (II) feeds several times alternating for short periods solvent and air into the central channels of the switching blocks of the lacquer changer (I). The lacquer changer is preferentially installed with the cleaner block at the top.



## 4. Technical Data

Denomination	APSON LCN-2008
Media	Lacquers, solvents, caustic solutions, weak acid solutions, a.o.
Medium pressure	max. 12 bar
Valve assembly	APSON 2/2-Ways Valves 200x, deadroom-free valve technology
Materials	Inoxidable steel
Seals	Viton™, or on customer's request
Media inputs	for hose and massive tube, on customer's request
Medium output	for hose D = 8 mm, d = 6 mm, or on customer's request
Dimensions of one block	<ul style="list-style-type: none"> <li>without valves: length 80 mm, width 53 mm, height 64 mm</li> <li>with valves: length 156 mm, width 53 mm, height 64 mm</li> </ul>
Mass	approx. 1.6 kg per lacquer change-over block

## 5. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Changer LCN-2008 Newteable, <i>without cleaner</i> and media inputs, or on customer's request	050-Axxx
APSON Pulse Cleaner PC-2000 (standard cleaner)	070-A005
APSON Turbo-Pulse Cleaner TPC-2001 (alternative cleaner)	070-A002
APSON Turbo Cleaner TC-2002 (alternative cleaner)	070-A004
APSON 2/2-Ways Lacquer Valve LV-2000-2.2 (sparepart)	060-A012



APSON 2/2-Ways Lacquer Valve LV-2017-PF-2.2 (sparepart)	060-A033
APSON 2/2-Ways Lacquer Valve LV-2017-T-2.2 (sparepart)	060-A035

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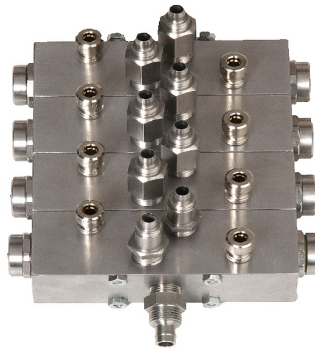
# Lacquer Changer LCM-2010 Mini

704.1 V3

## 1. Introduction

The **APSON Lacquer Changer LCM-2010 Mini** is a *very compact* paint changer for aggressive, liquid working materials such as varnishes, solvents, alkalis. Due to its construction and the large throughput it is very well rinseable and employable both for *Universal Lacquers* and *Metallic Lacquers*. Furthermore, this paint changer type is also useable as a flushable *distributor*.

Due to the employed valve type with tandem piston, **APSON Minivalve VNT-3011**, the paint changer is operable with the *standard* pneumatics pressures used in the industry.



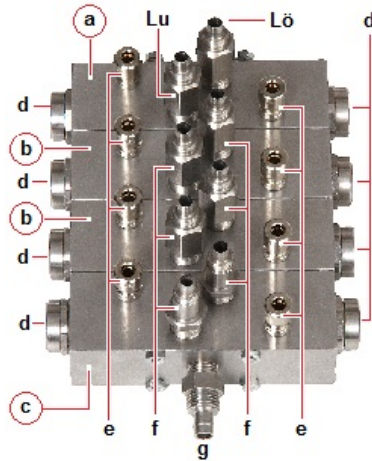
APSON LCM-2010 equipped with APSON Minivalve VNT-3011

## 2. Features

- Environmentally friendly due to very good rinseability and short flushing times.
- Costs saving due to minimized material and solvent consumption.
- Particularly compact and suitable for tight spaces.
- Deadspace-free APSON Minivalves VNT-3011, rinsing- and throughput-optimized material channels.
- Made of stainless steel, wear-resistant and resistant to alkalis and weak acids.
- Extendable to the desired number of material inputs resp. varnishes.
- Easy handling during installation and maintenance.

## 3. Structure and Function

The APSON LCM-2010 consists of at least one *purge block* (at the top), a *variable* number of *extension blocks* (standard mini-valve blocks in middle part), and an *outlet block* with central output channel (at the bottom end). All valve blocks are screwed together and are fittable with maximum two mini-valves per block. For fixing the paint changer, an angular profile is to be provided. In the following picture the nuts of the hose connectors are not shown.



APSON LCM-2010 equipped with APSON Minivalves VNT-3011

**Legend:** a=purge block with a connector for Lu=air and a connector for Lö=solvent (top most connector), b=extension blocks, c=outlet block, d=mini valves, e=connectors for pneumatic control, f=material inlets, g=material outlet.

## 4. Technical Data

Denomination:	APSON LCM-2010
Working materials:	Lacquers, solvents, alkalis, a.o.
Material pressure:	Max. 15 bar *
Pneumatic control pressure:	Approx. 6 – 8 bar *
Valve equipment:	2/2-Ways APSON Minivalves VNT-3011 (for stub-conducts or ring-conducts with continuous material circulation) *
Materials:	Stainless steel, Viton™, Kalrez™, Teflon™ *
Working material inlets and outlet:	For hose D = 8 mm, d = 6 mm *
Dimensions unequipped, L x W x H:	Approx. 79 mm x 25 mm x 25 mm
Dimensions equipped, L x W x H:	Approx. 98 mm x 25 mm x 60 mm, together with valves and connectors
Mass, unequipped:	Approx. 300 g, per block, if made of stainless steel
Mass, equipped:	Approx. 370 g, per block, together with valves and connectors

\* Or according to customer specification.

## 5. Ordering Data

Denomination	Order-Nr.
APSON Lacquer Changer LCM-2010 Mini (consisting of rinsing block, outlet block and a number of extension blocks, in accordance with clients request)	050A__
APSON Minivalve VNT-3011	060A060

Option: Connectors for ring-conducts with continuous material circulation, or in accordance with customer specification.

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# Lacquer Changer LCLT-20K4 Inline

## 1. Introduction

The **APSON Lacquer Changer LCLT-20K4 Inline** is a modular expandable switching unit for pressurized chemically aggressive work materials, e.g. paints, solvents, alkalis. It is an evolution of the standard lacquer changer type and belongs to the class of inline paint changers with large inline throughput for many delivery points. The paint changer consists of a maximum of 23 switching blocks. Each block is provided with **1 throughput channel (inline channel)** and **4 independent output channels (A-B-C-D)**. Each output channel of a block is independent of the other output channels and can be fitted with pneumatically controlled APSON valves or APSON locking screws. This lacquer changer type is also deliverable as **piggable/newteable** execution (APSON LCLT-20K4- N, Lacquer Changer for recovering the residual amounts).

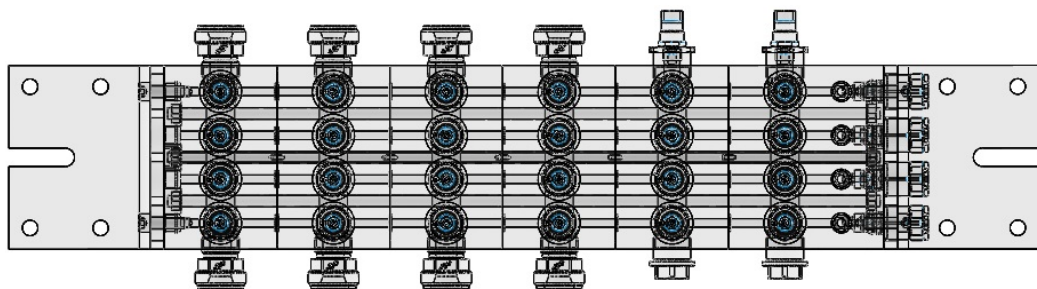


Fig. 1: APSON LCLT-20K4 Inline for 4 paints (with 1 air- and 1 dump-block)

**Due to the multi-channel, economical A-B to A-B-C-D systems or special applications are realisable.** All four output channels can be switched through to the same paint, or any output channel can be switched through to a different paint. The piggable execution of the paint changer allows coating processes without work breaks (back pushing of the residual quantities, flushing the lines, re-charging with new work material), because the inactive part of the system can be used for recovering the residual amounts of old paint type and for pre-charging with a new type of paint, while a different part of the system is producing.

The piggable **APSON LCLT-20K4-N** enables almost complete recovery of the residual amounts by back pushing the work material from the supply lines and paint changers into the supply system. It offers large material throughput and allows, due to the construction and the used dead-space-minimized APSON valve technology, very good rinsing of both, the supply lines as well as the output lines of the paint system.

## 2. Features

- Large inline throughput and very good rinsing, N-version is piggable.
- Environmentally friendly due to short rinsing times and work material recovery (N version)
- Modular expandable to the desired number of media (up to 23 blocks).
- Dead-space-minimized valves, and rinsing- and throughput-optimized ducts.
- Cost-saving due to 4 channels and minimal work material consumption.
- Easy handling during installation and maintenance.
- Material: Stainless steel, therefore durable and wear resistant.
- Resistant to alkalis and weak acids.

### 3. Structure and Function

The **APSON LCLT-20K4** consists of a maximum of twenty-one 4-channel switch blocks for paint (LB), a lacquer changer end-block (special switch block, normally at upper end) for the media outlet, and a cleaner/dump group (usually at lower end). The cleaner/dump group consists of a normal switch block (AB) for supply of air and a special dump block (DB) for the supply of solvent (S) and for rinsing (dump or recycle).

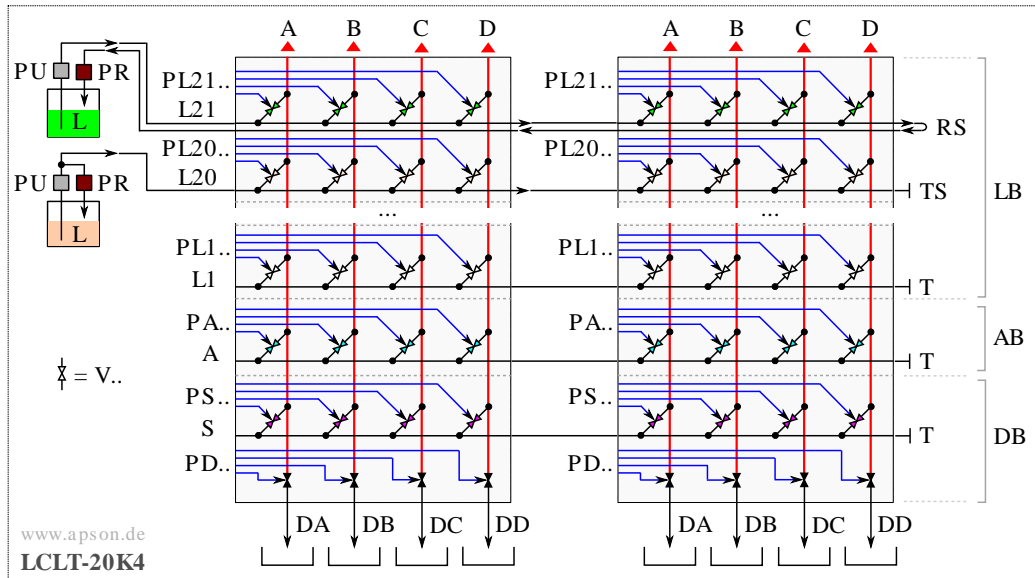


Fig. 2: APSON LCLT-20K4 -- Functional Scheme (example with 2 lacquer changers)

**Legend:** LB = switching blocks for paint, AB = switching block for air, DB = switching block for dump or recycling; A, B, C, D = output channels, V = 2/2-way valves, L.. = paint or work medium, PL.. = control air for lacquer valves (pneumatic), PU = pump, PR = pressure regulator / pressure limiter, RS = loop system (example for decanting work media), TS = stub system (example), T = screw plug, PA.. = control air for air (A), PS.. = control air for solvent (S), D.. = dump or recycle.

The air-block and each paint block have four screw sockets for paint valves. The dump-block has four frontal outputs, four frontal and four end-sided screw sockets for paint valves. Thus per block, four inline channels can be independently switched-through to the four output channels. The lacquer changer blocks have at one end of each output channel a seal (one per channel) for sealing of the adjacent blocks and two pins to align the blocks when assembling the lacquer changer. The components are made of stainless steel as standard.

During a rinsing cycle, the respective valves of the cleaner/dump group (AB and DB) supply several times alternately, for a short time air and solvent into the to be rinsed output channel of the switch blocks of the actual paint changer (LB).

### 4. Technical Data

Denomination	<b>APSON Lacquer Changer LCLT-20K4 Inline</b> , with cleaner/dump group, without hose and tube fittings (or according to customer's requests)
Work materials / Media	Lacquers, solvents, caustic solutions, weak acid solutions, a.o.
Number of blocks	Max. 23 blocks (max. 21 blocks for paint)
Work material pressure	Max. 15 bar
Valve assembly (optional)	APSON 2/2-Ways Valves LV 2014-6P, dead-space-minimized valve technology, arrangement and assembly according to customer's requests
Materials	Stainless steel

Seals	Viton™, or according to customer's request
Inline passages	<b>DN20</b> , for pipe connections, or according to customer's requests
Connections for paint	G1", or reduced, according to customer's request
Connections for air, solvent	G1/4", for hose D = 8 mm, d = 6 mm, or according to customer's request
Dimensions of one block LxWxH [mm]	70 x 130 x 80 (without valves and fittings)
Mass	Approx. 4.9 kg per block

## 5. Ordering Data

Denomination	Part-Nr.
<b>APSON Lacquer Changer LCLT-20K4</b> , with cleaner/dump group, without pipe and hose fittings. Number of paints or special designs according to customer's request.	050-A296
<b>APSON Lacquer Changer LCLT-20K4-N, Piggable</b> , with cleaner/dump group, without pipe and hose fittings. Number of paints or special designs according to customer's request.	050-A296-1
APSON 2/2-way valve lacquer LV 2014-6P (spare parts)	060-A039-6
APSON screw plug VS-2008 (spare part)	100-0886
APSON check valve (spare parts)	100-A014-5
APSON reduction G3/4" - G1/2" (spare parts)	200-0655
APSON screw plug G3/4" (spare parts)	200-0656

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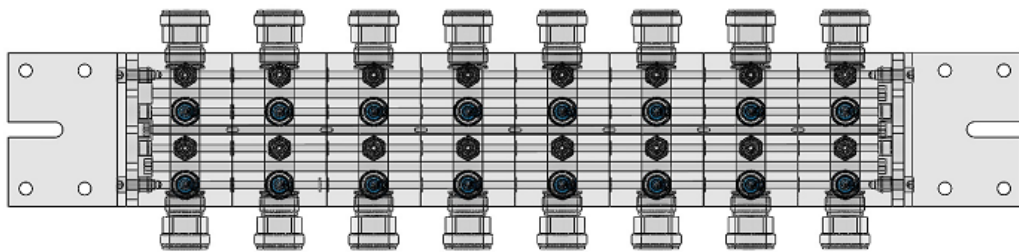
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# Lacquer Changer LCLT-25K4 Inline

## 1. Introduction

The **APSON Lacquer Changer LCLT-25K4 Inline** is a modular expandable switching unit for pressurized chemically aggressive work materials, e.g. paints, solvents, alkalis. It is an evolution of the standard lacquer changer type and belongs to the class of inline paint changers with large inline throughput for many delivery points. The paint changer consists of a maximum of 23 switching blocks. Each block is provided with **1 throughput channel (inline channel)** and **4 independent output channels (A-B-C-D)**. Each output channel of a block is independent of the other output channels and can be fitted with pneumatically controlled APSON valves or APSON locking screws. This lacquer changer type is also deliverable as **piggable/newteable** execution (APSON LCLT-25K4- N, Lacquer Changer for recovering the residual amounts).



FigAbb. 1: APSON LCLT-25K4 Inline for 8 lacquers (max. 23 lacquers)

**Due to the multi-channel, economical A-B to A-B-C-D systems or special applications are realisable.** All four output channels can be switched through to the same paint, or any output channel can be switched through to a different paint. The piggable execution of the paint changer allows coating processes without work breaks (back pushing of the residual quantities, flushing the lines, re-charging with new work material), because the inactive part of the system can be used for recovering the residual amounts of old paint type and for pre-charging with a new type of paint, while a different part of the system is producing.

The piggable **APSON LCLT-25K4-N** enables almost complete recovery of the residual amounts by back pushing the work material from the supply lines and paint changers into the supply system. It offers large material throughput and allows, due to the construction and the used dead-space-minimized APSON valve technology, very good rinsing of both, the supply lines as well as the output lines of the paint system.

## 2. Features

- Large inline throughput and very good rinsing, N-version is piggable.
- Environmentally friendly due to short rinsing times and work material recovery (N version)
- Modular expandable to the desired number of media (up to 23 blocks).
- Dead-space-minimized valves, and rinsing- and throughput-optimized ducts.
- Cost-saving due to 4 channels and minimal work material consumption.
- Easy handling during installation and maintenance.
- Material: Stainless steel, therefore durable and wear resistant.
- Resistant to alkalis and weak acids.

### 3. Structure and Function

The **APSON LCLT-25K4 Inline** consists of a maximum of twenty-three switch blocks, each with a large inline channel (DN25) and with four output channels (A, B, C, D). The uppermost block and the lowermost block (end blocks) are special blocks for assembling and fixing the paint changer and for connecting the output channels. Long lacquer changers with more than 11 blocks have a special block (center block) with threaded holes for assembly by means of threaded rods.

Each block has four screw sockets for pneumatically controllable APSON 2/2-ways valves. Thus allows per block, that the associated inline channel can be switched through to max. four output channels. The blocks have to each one end of the output channel one O-ring (per channel) for sealing the adjacent blocks, and two pins for aligning the blocks when assembling the paint changer. The components are made as standard of stainless steel. For rinsing (rinse cycle), the respective valves of an external cleaner group supply several times alternately, for a short time air and solvent into the to be rinsed output channel of the paint changer.

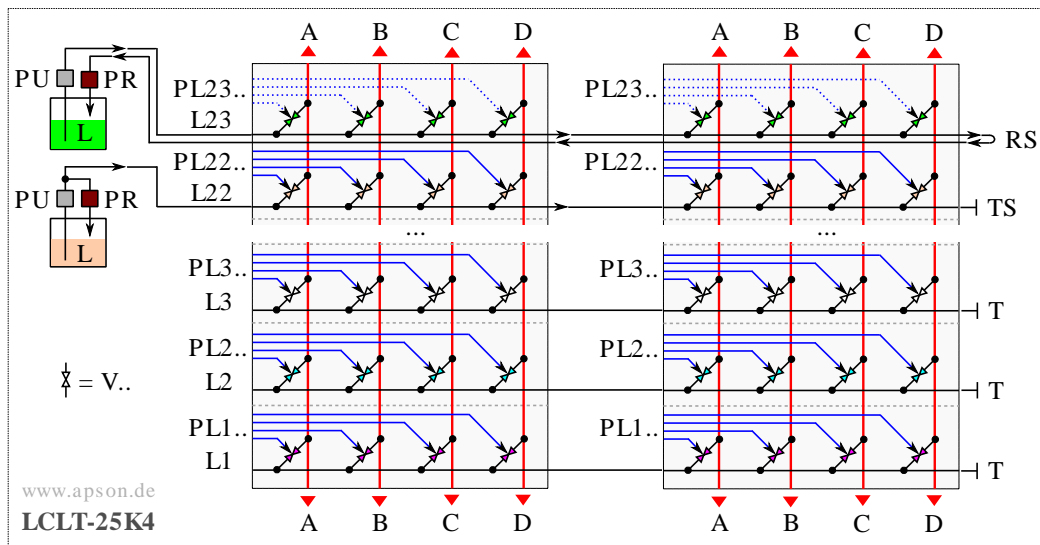


Fig. 2: APSON LCLT-25K4 -- Functional Scheme (example with 2 lacquer changers)

**Legend:** A, B, C, D = output channels, V = 2/2-way valves, L.. = paint or work medium, PL.. = control air for lacquer valves (pneumatic), PU = pump, PR = pressure regulator / pressure limiter, RS = loop system (example for decanting work media), TS = stub system (example), T = screw plug.

### 4. Technical Data

Denomination	<b>APSON Lacquer Changer LCLT-25K4 Inline</b> , without pipe and hose fittings (or according to customer's requests)
Media	Lacquers, solvents, alkalis, weak acids, a.o.
Number of blocks	Max. 23 blocks
Material pressure	Max. 15 bar
Valve assembly (optional)	APSON 2/2-Ways Valves LV 2014-6P, dead-space-minimized valve technology, arrangement and assembly according to customer's requests
Materials	Stainless steel
Seals	Viton™, or according to customer's request
Inline passages	<b>DN25</b> , for pipe connections, or according to customer's requests
Connections for paint	G1", or reduced, according to customer's request
Connections for air, solvent	G1/4", for hose D = 8 mm, d = 6 mm, or according to customer's request

Dimensions of one block LxWxH [mm]	70 x 130 x 80 (without valves and fittings)
Mass	Approx. 5.2 kg per block

## 5. Ordering Data

Denomination	Part-Nr.
<b>APSON Lacquer Changer LCLT-25K4</b> , without pipe and hose fittings. Number of paints or special designs according to customer's request.	050-A297
<b>APSON Lacquer Changer LCLT-25K4-N, Piggable</b> , without pipe and hose fittings. Number of paints or special designs according to customer's request.	050-A297-1
APSON 2/2-way valve lacquer LV-2014-6P (spare parts)	060-A039-6
APSON screw plug VS-2008 (spare part)	100-0886

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## Part II. APSON 2C Switching Blocks

1.



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# 2C Switching Block XMY-2009 HB with Backpropagation

## 1. Introduction

The APSON 2C Switching Block XMY-2009 HB with Backpropagation belongs to the class of the special switching blocks for 2-components lacquers with hardener. Due to its characteristics it improves the quality and increases the efficiency of the coating process.

This type of switching block is particularly suitable to the employment in automatic coating systems with often to change chemically aggressive media, e.g. lacquers, hardeners, solvents, caustic solutions, a.o. It is applicable both for 2C normal lacquers and 2C metallic lacquers.



APSON 2C Switching Block XMY-2009 HB with Backpropagation

Conventional medium switching blocks for 2-components lacquers are not optimized and have usually channels for supplying the lacquer components and at least one channel for exhaust of the lacquer product. In practice the lacquer product in these channels can harden. This leads to problems during painting and when rinsing the medium switching blocks. Clogged medium switching blocks must be exchanged at expensive timely costs and the medium channels must again be drilled out.

The APSON 2C Switching Block XMY-2009 HB with Backpropagation is equipped with high-quality dead-space-free APSON valve technology and has mixing areas with minimum volume within the ranges within which the master lacquer mixes with the hardener. These mixing areas are optically examinable and fastly cleanable. Hardenings of the lacquer product cannot develop during the normal operation. If this should occur nevertheless, the ready status of the APSON 2C Switching Blocks is restorable in shortest time.

## 2. Features

The APSON 2C Switching Block XMY-2009 HB with Backpropagation has the following capability characteristics:

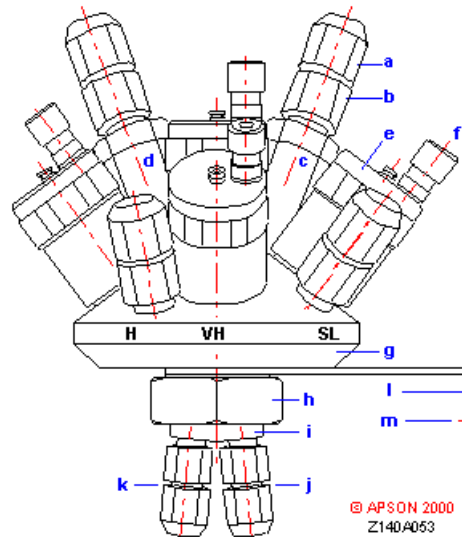
- Produces high-quality medium mixture by turbulent pre-mixing of the media already when meeting the media in the mixing area.
- Does not form air columns because the mixing area has no media channels.
- Reaches 100% utilization of material (no hardened medium columns in channels).
- Is environmentally careful due to media recuperation and short rinsing times.
- Is cost-saving due to minimized media consumption.
- Makes possible simple handling when assembling and maintenance.

- Has dead-space-free APSON valve technology.
- Has rinsing- and throughput-optimized media channels.
- Consists of inoxidable steel, thus corrosion resistant and wear resistant.
- Is insensitive to caustic solutions and weak acids.

### 3. Structure

The APSON 2C Switching Block XYM-2009 HB with Backpropagation consists mainly of:

- A solid valve block with connection- and valve-designations.
- Five APSON valves (see Ordering Data).
- Tube connectors for the connection of the media.
- Output cone with output terminal, backpropagation connection and union nut.
- Optionally two checkvalves (for pulsation air and solvent).
- An attaching bracket.



APSON 2C Switching Block XYM-2009 HB with Backpropagation

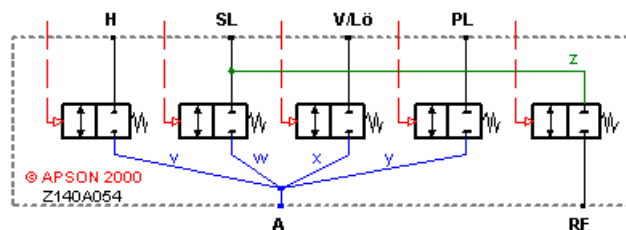
Legend: a = SL screw nut/mother, b = SL screw connection, c = Checkvalve, d = Checkvalve, e = Valve, f = Pneumatics connection, g = 2C switching block, h = Union nut, i = Output cone, j = 2C-lacquer outlet, k = Feedback, l = Attaching bracket, m = 2 Holes  $\varnothing 7$  mm, (horiz. hole spacing 20 mm)

The APSON 2C Switching Block XYM-2009 HB with Backpropagation is made of inoxidable steel and is fastened by means of the attaching bracket to a suitable place.

The media hoses are attached by means of the tube connectors at the respective marked media connections for master lacquer (SL), hardener (H), diluant resp. solvent (V/Lo), pulsation air (PL) and feedback (RF). The union nut at the output cone makes possible fast disassembly for purpose of maintenance resp. inspection.

### 4. Function

The 2C-lacquer product necessary for painting results in the mixing area of the 2C switching block from simultaneous open valves for master lacquer and hardener. The 2C-lacquer product then flows through the outlet A of the 2C switching block and through a Mixer/Homogeniser which can be connected at the outlet.



APSON 2C Switching Block XMY-2009 HB with Backpropagation - Functional Scheme

Channel lengths:  $L_v = L_w = L_x = L_y = 0.2 \text{ mm}$ ;  $L_z = 1.0 \text{ mm}$

Channel volumes:  $V_v + V_w + V_x + V_y = 0.2 \text{ ml}$ ;  $V_z = 0.01 \text{ ml}$

For changing the lacquer, the master lacquer in the lacquer hose can be pushed out through the exit (RF) by opening the feedback valve, and so to be gained back for re-use. Subsequently the lacquer hose for the master lacquer is to be rinsed, as well as the 2C switching block.

For rinsing the 2C switching block, the valves for master lacquer (SL) and hardener (H) are to be closed. Subsequently, the valves for the solvent (V/Lo) and for the pulsation air (PL) are to be opened and closed periodically and alternating. Thus an air/solvent sequence results as follows: air-solvent-air-solvent...

## 5. Technical Data

Denomination:	APSON 2C Switching Block XMY-2009 HB <i>with</i> Backpropagation
Media:	Normal and metallic lacquers, hardener, solvent, caustic solutions, a.o.
Media pressure:	Max. 20 bar
Valve assembly:	APSON 2/2-Ways Valves 2009, dead-space-free valve technology
Material:	Inoxidable steel
Seals:	Viton™, or in accordance with customer's request
Media entrances:	For hose D = 8 mm, d = 6 mm (or in accordance with customer's request)
Output terminal:	For hose D = 8 mm, d = 6 mm (or in accordance with customer's request)
Dimensions, L x W x H [mm]:	Without valves: 70 x 70 x 45 With valves: 140 x 140 x 120
Mass:	1.3 kg (with valves)

## 6. Ordering Data

Denomination	Quantity	Part-Nr.
APSON 2C Switching Block XMY-2009 HB <i>with</i> Backpropagation (with valves, attaching brackets and SL screw connections)	1	050-A046
APSON 2/2-Ways Valve 2009 (sparepart)	5	060-A013
APSON Mixer/Homogeniser	1	200-0270
APSON Gasket Kit (sparepart)	1	300-0021
APSON Checkvalve for the connection of pulsation air and/or solvent (option)	2	100-A004

## Options

Other materials or capability characteristics on customer's request against surcharge.

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# 2C Switching Block XMY-2010 H *without* Backpropagation

## 1. Introduction

The APSON 2C Switching Block XMY-2010 H *without* Backpropagation belongs to the class of the special switching blocks for 2-components lacquers with hardener. Due to its characteristics it improves the quality and increases the efficiency of the coating process.

This type of switching block is particularly suitable to the employment in automatic coating systems with often to change chemicaly aggressive media, e.g. lacquers, hardeners, solvents, caustic solutions, a.o. It is applicable both for 2C normal lacquers and 2C metallic lacquers.



APSON 2C Switching Block XMY-2010 H without Backpropagation

Conventional medium switching blocks for 2-components lacquers are not optimized and have usually channels for supplying the lacquer components and at least one channel for exhaust of the lacquer product. In practice the lacquer product in these channels can harden. This leads to problems during painting and when rinsing the medium switching blocks. Clogged medium switching blocks must be exchanged at expensive timely costs and the medium channels must again be drilled out.

The APSON 2C Switching Block XMY-2010 H *without* Backpropagation is equipped with high-quality dead-space-free APSON valve technology and has mixing areas with minimum volume within the ranges within which the master lacquer mixes with the hardener. These mixing areas are optically examinable and fastly cleanable. Hardenings of the lacquer product cannot develop during the normal operation. If this should occur nevertheless, the ready status of the APSON 2C Switching Blocks is restorable in shortest time.

## 2. Features

APSON 2C Switching Block XMY-2010 H *without* Backpropagation has the following capability characteristics:

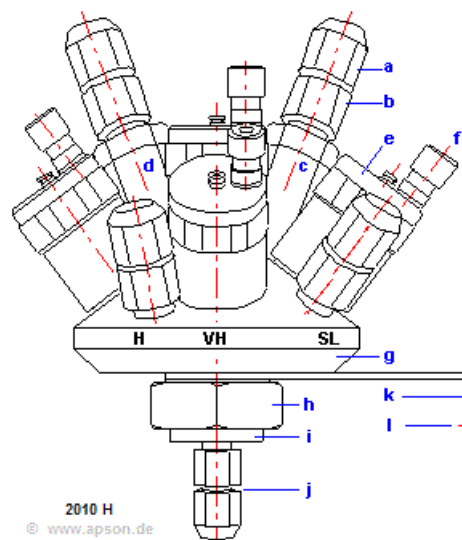
- Produces high-quality medium mixture by turbulent pre-mixing of the media already when meeting the media in the mixing area.
- Does not form air columns because the mixing area has no media channels.
- Reaches 100% utilization of material (no hardened medium columns in channels).
- Is environmentally careful due to media recuperation and short rinsing times.
- Is cost-saving due to minimized media consumption.
- Makes possible simple handling when assembling and maintenance.

- Has dead-space-free APSON valve technology.
- Has rinsing- and throughput-optimized media channels.
- Consists of inoxidable steel, thus corrosion resistant and wear resistant.
- Is insensitive to caustic solutions and weak acids.

### 3. Structure

The APSON 2C Switching Block XMY-2010 H *without* Backpropagation consists mainly of:

- A solid valve block with connection- and valve-designations.
- Five independent APSON valves (see Ordering Data).
- Tube connectors for the connection of the media.
- Output cone with output terminal and union nut.
- Optionally two checkvalves (for pulsation air and solvent).
- An attaching bracket.



APSON 2C Switching Block 2010 H without Backpropagation

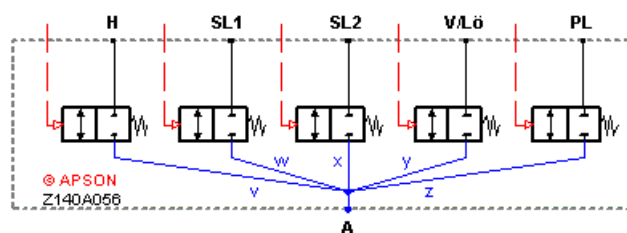
Legend: a = SL screw nut/mother, b = SL screw connection, c = Checkvalve, d = Checkvalve, e = Valve, f = Pneumatics connection, g = 2C switching block, h = Union nut, i = Output cone, j = 2C-lacquer outlet, k = Attaching bracket, l = 2 Holes  $\varnothing 7$  mm, (horiz. hole spacing 20 mm)

The APSON 2C Switching Block XMY-2010 H *without* Backpropagation is made of inoxidable steel and is fastened by means of the attaching bracket to a suitable place.

The media hoses are attached by means of the tube connectors at the associated marked media connections for the master lacquers (SL1 and SL2), hardener (H), diluant resp. solvent (V/Lo) and pulsation air (PL). The union nut at the output cone makes possible fast disassembly for purpose of maintenance resp. inspection.

### 4. Function

The 2C-lacquer product necessary for painting results in the mixing area of the 2C switching block from simultaneous open valves for master lacquer and the hardener. The 2C-lacquer product then flows through the outlet A of the 2C switching block and through a Mixer/Homogeniser which can be connected at the outlet.



APSON 2C Switching Block XMY-2010 H without Backpropagation - Functional Scheme

Channel lengths:  $L_v = L_w = L_x = L_y = L_z = 0.2 \text{ mm}$

Channel volume:  $V_v + V_w + V_x + V_y + V_z = 0.2 \text{ ml}$

For changing the lacquer, the master lacquer in the lacquer hose can be pushed out through the outlet A by opening the respective lacquer valve. Subsequently the lacquer hose for the master lacquer is to be rinsed, as well as the 2C switching block.

For rinsing the 2C switching block, the valves for master lacquer (SL1 resp. SL2) and hardener (H) are to be closed. Subsequently, the valves for the solvent (V/Lö) and for the pulsation air (PL) are to be opened and closed periodically and alternating. Thus an air/solvent sequence results as follows: air-solvent-air-solvent...

## 5. Technical Data

Denomination:	APSON APSON 2C Switching Block XMY-2010 H <i>without</i> Backpropagation
Media:	Normal and metallic lacquers, hardener, solvent, caustic solutions, a.o.
Media pressure:	Max. 20 bar
Valve assembly:	APSON 2/2-Ways Valves 2009, dead-space-free valve technology
Material:	Inoxidable steel
Seals:	Viton™, or in accordance with customer's request
Media entrances:	For hose D = 8 mm, d = 6 mm (or in accordance with customer's request)
Output terminal:	For hose D = 8 mm, d = 6 mm (or in accordance with customer's request)
Dimensions L x W x H [mm]:	Without valves: 70 x 70 x 45 With valves: 140 x 140 x 100
Mass:	1.3 kg (with valves)

## 6. Ordering Data

Denomination	Quantity	Part-Nr.
APSON APSON 2C Switching Block XMY-2010 H <i>without</i> Backpropagation (with valves, attaching brackets and SL screw connections)	1	050-A048
APSON 2/2-Ways Valve 2009 (sparepart)	5	060-A013
APSON Mixer/Homogeniser	1	200-0270
APSON Gasket Kit (sparepart)	1	300-0021
APSON Checkvalve for the connection of pulsation air and/or solvent (option)	2	100-A004

## Options

Other materials or capability characteristics on customer's request against surcharge.

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## Part III. APSON Lacquer Valves

1.



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# 2/2-Ways Lacquer Valves VNT-200x

## 1. Introduction

APSON 2/2-Ways Lacquer Valves 200x are pneumatically operatable compact needle valves made of inoxidable steel. They fulfill their function together with modules intended therefore e.g. valve blocks, lacquer distributors, sprayheads etc. They are designed for applications with aggressive non-granular fluid media, e.g. lacquers, solvents, caustic solutions, a.o.



APSON 2/2-Ways Lacquer Valves (e.g. 2000, 2003 and 2002)

## 2. Features

- Fast error recognition in the lacquer system by directly evident switching status.
- Early detecting of leakage of the medium as well as the pneumatics air.
- Mechanical operation of the valve with a special tool possible.
- Delimitation of the flow rate by variable operating path.
- Fast valve exchange, and efficient maintenance and spareparts management.
- Small pressure losses between medium inlet and medium outlet.
- Very good rinsing characteristics, because of APSON deadroom-free valve technology.
- Very compact design.

## 3. Structure and Function

The valves are built from the drive in the pneumatics chamber, a seal packing in the intermediate chamber and the medium seals in the medium chamber (actually the valve). Furthermore the valves have a mechanical visual display for the switching status.



APSON 2/2-Ways Lacquer Valves (e.g. 2000, 2003 and 2002)

The *drive* consists of the pneumatic cylinder, a piston with sealing diaphragm, the valve needle and the pre-compressed spring for closing the valve, if the valve is not addressed with compressed air. The piston and the valve needle are rigidly connected together.

The *seal packing* (medium barrier) consists of several seals, which manage the sealing at the valve needle by means of a pre-compressed spring, on the one hand to the medium chamber and on the other hand to the pneumatics chamber.

The *medium seal* consists of the valve needle head and seals which withstand aggressive media. All seals of the valve must therefore be adapted to the media which are to be used.

The mechanical *visual display* consists of a display pin for the switching status of the valve. The display pin is rigidly connected with the valve needle. The valve can be switched by pulling on the display pin manually. Optionally the possibility exists for sensing electrically the status of the valve by means of a proximity sensor.

In the screwed in status with the appropriate valve block, the valve forms one discrete medium chamber each with a radial inlet and an axial outlet with sealing seat for the medium.

In the *inactive status* (normal condition), if no compressed air or control signal pends, the valve is closed. In the *active status*, when the valve is subjected with compressed air, the piston provided with a fastened diaphragm and fixed at the valve needle squeezes the recoil spring together. Thereby the valve needle is raised from its sealing seat at the axial outlet. Thus the flow of the medium is released.

## 4. Technical Data

<b>Denomination:</b>	<b>APSON Lacquer Valves 200x</b>
Media:	Aggressive media (lacquer, solvent, caustic solution, a.o.)
Medium pressure:	approx. 12 bar (or in accordance with customer's request)
Pneumatic control air pressure:	6 to 8 bar
Medium-touching housing parts:	Inoxidable steel
Piston seal:	Teflon™
Main seal:	Teflon™ (optional Kalrez™ or FFKM™)
Housing seals:	Viton™

## 5. Service Life

For the APSON Lacquer Valves 200x the following service lives were determined within the basecoat area. The service life for valves, at operation with basecoat lacquer amounts to approx. 500,000 operating cycles. For a troublefree operation of the lacquer valves all 300,000 operating cycles a visual inspection must be executed. The visual inspection is to be executed first at the installed valve and afterwards in the unscrewed status.

The installed valve must be outward absolutely tight:

- If pneumatic air withdraws from the bleed bore (annular gap cover), the pneumatic seal at the piston must be exchanged.
- If pneumatic air withdraws from the exhausting drilling of the valve needle, the piston sided seal (air side) of the valve needle for the pneumatic control air must be exchanged.
- If lacquer withdraws from the exhausting drilling of the valve needle, the seal at the valve needle (lacquer side) must be exchanged.

At the unscrewed valve the following critical parts are to be checked for wear:

- Main seal of the needle
- O-rings of the valve
- Needle seals to compressed air side or to the lacquer side

**Important:** After approx. 300,000 switching cycles the compression spring in the pneumatics chamber must be exchanged by a new compression spring. The exchange can be made with installed valve within one minute. For the sake of safety, the medium can be switched pressure-free. Eventually the inner surface of the pneumatic cylinder is to be coated again with valve fat.

## 6. Ordering Data

Denomination	Part-Nr.
APSON 2/2-Ways Lacquer Valve 2015, PF2 (for Lacquer Changer 2000, a.o.)	060-A030
APSON 2/2-Ways Lacquer Valve 2016, PF2 (for Lacquer Changer 2009, 2010, a.o.)	060-A031
APSON 2/2-Ways Lacquer Valve 2017, PF2 (for Lacquer Changer 2008 N, a.o.)	060-A033
APSON 2/2-Ways Lacquer Valve 2017, T3 (for Lacquer Changer 2008 N, a.o.)	060-A035
APSON 2/2-Ways Lacquer Valve 2014, T3 (for Lacquer Changer 2000, a.o.)	060-A029
APSON 2/2-Ways Lacquer Valve 2014, P (for Lacquer Changer LCLT-20K4 and LCLT-25K4, a.o.)	060-A039-6
APSON 2/2-Ways Lacquer Valve 2000 with special seal (for Lacquer Changer 2000, a.o.)	060-A008
APSON 2/2-Ways Lacquer Valve 2000 (for Lacquer Changer 2000, a.o.)	060-A010
APSON 2/2-Ways Lacquer Valve 2009, PF2	060-A013
APSON 2/2-Ways Lacquer Valve 2001 - (old!)	(060-A002)
APSON 2/2-Ways Lacquer Valve 2002 (for lacquer Changer 2007)	060-A004
APSON 2/2-Ways Lacquer Valve 2003 (for APSON Sprayhead 200x)	060-A011

### Options

- Main seal of Kalrez™
- Non-medium-touching housing parts from aluminum

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# 3/2-Ways Lacquer Valve VNT-2004

## 1. Introduction

The APSON 3/2-Ways Lacquer Valve 2004 is a pneumatically controllable compact needle valve made of inoxidable steel. It fulfills its function together with modules intended therefore, e.g. valve blocks, lacquer distributors, sprayheads, a.o. Valves of this type are designed as 3/2-ways valves for aggressive non-granular fluid media, e.g. lacquers, solvent, caustic solutions, a.o. They serve for switching the medium stream into two from each other separated media circuits.



APSON 3/2-Ways Lacquer Valve 2004

## 2. Features

- Fast error recognition in the lacquer system by directly evident switching status.
- Early detecting of leakage of the medium as well as the pneumatics air.
- Manual toggling of the valve with a special tool possible.
- Fast valve exchange, and efficient maintenance and spareparts management.
- Small pressure losses between medium inlet and medium outlets.
- Very good rinsing characteristics, because of APSON deadthroom-free valve technology.
- Very compact design.

## 3. Structure and Function

The valves consist of the drive in the pneumatics chamber, a seal packing in the intermediate chamber and the two medium seals in the medium chamber (actual valve). The valves have a mechanical visual display of the switching status.



APSON 3/2-Ways Lacquer Valve 2004

The *drive* consists of the pneumatic cylinder, a piston with sealing diaphragm, the valve needle and the pre-compressed spring for closing the valve, if the valve is not addressed with compressed air. The piston and the valve needle are rigidly connected together.

The *seal packing* (medium barrier) consists of several seals, which manage the sealing at the valve needle by means of a pre-compressed spring, on the one hand to the medium chamber and on the other hand to the pneumatics chamber.

The *medium seals* consist of the valve needle head and two seals, which withstand aggressive media. All seals of the valve must therefore be adapted to the media which are to be used.

The mechanical *visual display* consists of a display pin for the switching status of the valve. The display pin is rigidly connected with the valve needle. The valve can be switched by pulling on the display pin manually. Optionally the possibility exists for sensing electrically the status of the valve by means of a proximity sensor.

In the screwed in status with the appropriate valve block, the valve forms one discrete medium chamber, with one inlet and two outlets each with axial sealing seats for the medium.

The outlet which in normal condition (without control signal) is closed is called *normally closed* outlet. The other outlet is called thus *normally open* outlet.

In the *inactive* status (normal condition), no compressed air or control signal pends, and the normally closed outlet is closed and the normally open outlet is open.

In the *active* status, the valve is controlled with compressed air, and the piston formed by the diaphragm connected with the valve needle squeezes a spring together. Thereby the status of the outputs is toggled and the normally closed output is opened and the normally opened output is closed.

## 4. Technical Data

Denomination:	APSON 3/2-Ways Lacquer Valve 2004
Media:	Aggressive media (lacquer, solvent, caustic solution, a.o.
Medium pressure:	approx. 12 bar (or in accordance with customer's request)
Pneumatics air pressure:	6 to 8 bar
Medium-touching housing parts:	Inoxidable steel
Piston seal:	Teflon™
Main seals:	Teflon™ (optional Kalrez™)
Housing seals:	Viton™

## 5. Service Life

For the APSON 3/2-Ways Lacquer Valve 2004 the following service lives were determined within the basecoat area. The service life for valves, at operation with basecoat lacquer amounts to approx. 500,000 switching cycles. For a troublefree operation of this lacquer valve type, all 300,000 switching cycles a visual inspection must be executed. The visual inspection is to be executed first at the installed valve and afterwards in the unscrewed status.

The installed valve must be outward absolutely tight:

- If pneumatic air withdraws from the bleed bore (annular gap cover), the pneumatic seal at the piston must be exchanged.
- If pneumatic air withdraws from the exhausting drilling of the valve needle, the piston sided seal (air side) of the valve needle for the pneumatic control air must be exchanged.
- If *lacquer* withdraws from the exhausting drilling of the valve needle, the seal at the valve needle (lacquer side) must be exchanged.

At the unscrewed valve the following critical parts are to be checked for wear:

- Main seals of the needle
- O-rings of the valve
- Needle seals to compressed air side or lacquer side

**Important:** After approx. 300,000 switching cycles the compression spring in the pneumatics chamber must be exchanged by a new greased compression spring. The exchange can be managed without unscrewing the valve from its valveblock within one minute. For safety reasons the medium should be switched pressure-free during the exchange of the spring. Eventually the inner surface of the pneumatic cylinder is to be coated again with valve fat.

## 6. Ordering Data

Denomination	Part-Nr.
APSON 3/2-Ways Lacquer Valve 2004	060-A015

Options:

- Main seal from Kalrez™
- Non medium-touching housing parts from aluminum

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# Minivalve VNT-3011

## 1. Introduction

The **APSON Minivalve VNT-3011** is a *normally closed*, pneumatically controllable 2/2-ways tandem-valve for aggressive work materials, e.g. lacquers, solvents, alkalis. It operates with the standard pneumatic pressures of the industry. It is mainly used in **special applications** as well as in the **APSON Mini Lacquer Changer LCM-2010**.



Fig. 1: APSON Minivalve VNT-3011

## 2. Features

- Indicator for switch status and sealage resp. leakage.
- Very compact 2-pistons tandem-valve, suitable for the standard pneumatic pressures of the industry.
- Metallic parts made of stainless steel, seals are resistant against aggressive work materials.
- Assembly and disassembly using simple tools.

## 3. Structure and Function

The **APSON Minivalve VNT-3011** is a *normally closed* 2/2-ways valve. The casing and parts are made of stainless steel. Located inside the casing, (see figure 2), are two axially arranged pressure chambers, each with a piston and piston seal. Through these chambers leads pressure-tight an axial, movable hollow valve needle, at which the two pistons and the main seal of the valve are fixed. The rear part of the valve needle is visible and contains an axial bore. This allows to determine the switching state and the sealage or leakage of the valve. The work material and the pneumatic control air are supplied through the valve block.

If the pressure chambers are charged with compressed air, the valve opens. The air release is effected by ventilation holes. Due to the tandem design, the pushing forces of the two pistons sum. A compression spring in the compression spring chamber closes the valve as soon as it is no longer charged with compressed air. The actual valve chamber for switching of the work material and the sealing seat of the main seal are located in the respective valve block (see **APSON Mini Lacquer Changer LCM-2010**).

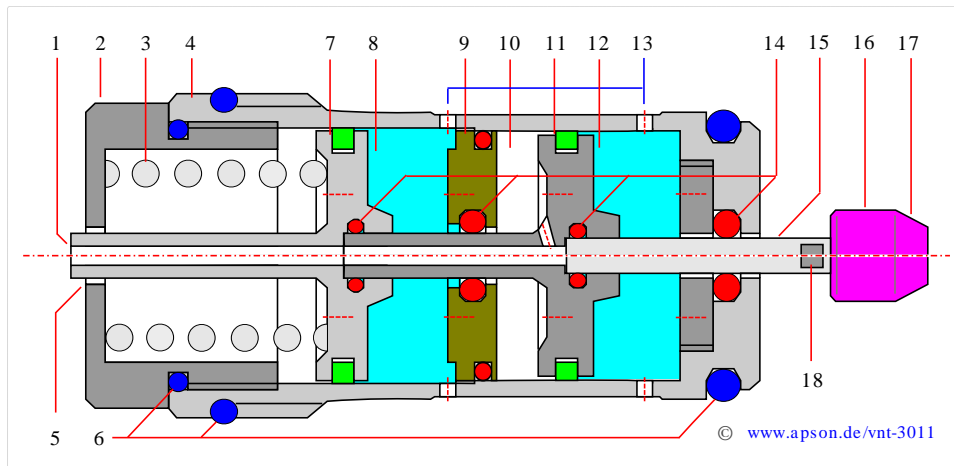


Fig. 2: APSON Minivalve VNT-3011 - Structure (simplified representation)

**Legend:** 1=indicator for the switching state and the sealage or leakage, 2=housing lid, 3=compression spring, 4=valve housing, (wrench size 17 mm), 5=venting bore of the pressure spring chamber, 6=housing seals, O-rings, 7=rear piston with piston seal, 8=rear pressure chamber, 9=sealing plate for the pressure chamber, 10=vent space, 11=front piston with piston seal, 12=front pressure chamber, 13=control-air channels, 14=valve needle seals, 15=valve needle, 16=main seal of the valve, 17=wrench surface (wrench size 1.5 mm).

## 4. Technical Data

<b>Designation:</b>	<b>APSON Minivalve VNT-3011</b>
Valve type:	Normally closed, 2/2-ways
Work materials:	Solventborn and waterborn lacquers, solvents, alkalis, a.o.
Work material pressure:	Max. 15 bar
Pneumatic control air pressure:	6 to 8 bar
Materials:	Housing parts: stainless steel, housing seals: Viton™
Seals of valve needle and pistons:	Teflon™ and/or Kalrez™, or on customers request
Main seal, valve needle cone:	UHMWP (Ultra High Molecular Weight Polyethylene)
Dimensions [mm] L x M, WS:	Approx. 47 x (M 17 x 1), wrench size 17
Mass:	Approx. 30 g

## 5. Ordering Data

Designation	Ordering-Nr.
APSON Minivalve VNT-3011	060A060

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# Minivalve VNT-3015

## 1. Introduction

The **APSON Minivalve VNT-3015** is a *normally closed*, pneumatically controllable 2/2-ways tandem-valve for aggressive work materials, e.g. lacquers, solvents, alkalis. It operates with the standard pneumatic pressures of the industry. It is mainly used in **special applications** as well as in **APSON SRS** safety lacquer changers.



Fig. 1: APSON Minivalve VNT-3015

## 2. Features

- Work material supply through hollow valve needle, casing very compact and smaller diameter.
- Valve closes tight with the casing, thereby good rinsing in the valve block.
- Compact 2-pistons tandem-valve, suitable for the standard pneumatic pressures of the industry.
- Metallic parts made of stainless steel, seals are resistant against aggressive work materials.
- Mounting in the valve block by pluggable connection and secured by locking screw.
- Assembly and disassembly using simple tools.

## 3. Structure and Function

The **APSON Minivalve VNT-3015** is a *normally closed* 2/2-ways valve. The casing and parts are made of stainless steel. The valve (see figure 2) mainly consists of a cylindrical casing with one axial inlet and one axial outlet, for the work material. Located inside the casing are three axially arranged chambers. Through these chambers leads pressure-tight an axial, movable hollow valve needle, at which two pistons and the main seal of the valve are fixed. The pneumatic control air is supplied through the valve block.

The *two chambers on the inlet side* each contain a pistons und are divided by them each into two partial-chambers - vent chamber and pressure chamber. If the pressure chambers are charged with compressed air, the valve opens. The air release is effected by ventilation holes. Due to the tandem design, the pushing forces of the two pistons sum. A compression spring in the first vent chamber closes the valve as soon as it is no longer charged with compressed air.

The *chamber on the outlet side* is the real valve chamber for switching of the work material. It has a sealing seat and contains the output of the hollow valve needle (radial throughput bores), as well as the main seal of the valve. The valve conducts the working material through the hollow valve needle with good throughput.

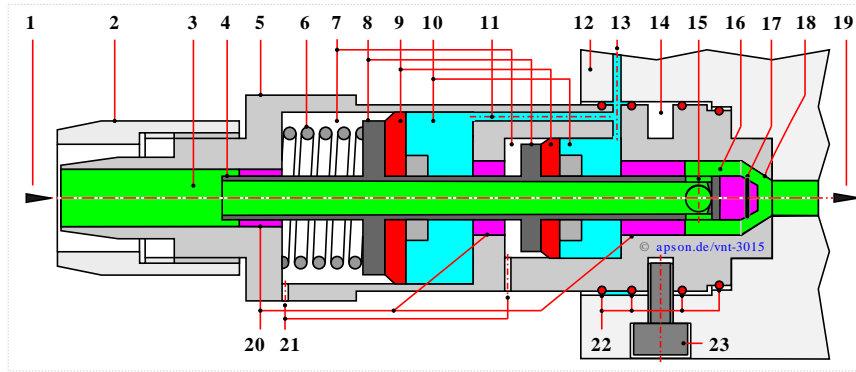


Fig. 2: APSON Minivalve VNT-3015 - Structure and Function

**Legend:** 1=inlet for work material, 2=hose connector, SL hose-nut, 3=work material, 4=hollow valve needle, 5=valve casing, 6=compression spring, 7=vent chambers, 8=pistons, 9=piston seals, 10=pressure chambers, 11=control-air channel, 12=valve block, 13=inlet for pneumatic control air, 14=periferal locking groove, 15=throughput bores from hollow valve needle to the valve chamber, 16=valve chamber, 17=main seal of the valve (for better understanding of the flow of the work material, the valve is shown in the *activ, open* status), 18=sealing seat of the main seal, 19=outlet for the work material, 20=valve needle seals, 21=ventilation bore holes, 22=case sealings, O-rings, 23=locking screw.

## 4. Technical Data

<b>Designation:</b>	<b>APSON Minivalve VNT-3015</b>
Valve type:	Normally closed, 2/2-ways
Work materials:	Solventborn and waterborn lacquers, solvents, alkalis, a.o.
Work material pressure:	Max 30 bar, hose-nut for hose [mm] d x D = 6 x 8
Pneumatc control air pressure:	6 to 8 bar
Casing parts:	Stainless steel
Main seal of hollow valve needle:	Kalrez™
Seals for pistons and valve needle cone:	UHMWP (Ultra High Molecular Weight Polyethylene)
Casing sealings:	Viton™, or on customers request
Casing dimensions [mm] L x M:	Approx. 80 x M 24
Mass:	Approx. 100 g
Approvals:	CE

## 5. Ordering Data

Designation	Ordering-Nr.
APSON Minivalve VNT-3015	060A070

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## Part IV. APSON Backstroke Valves

1.



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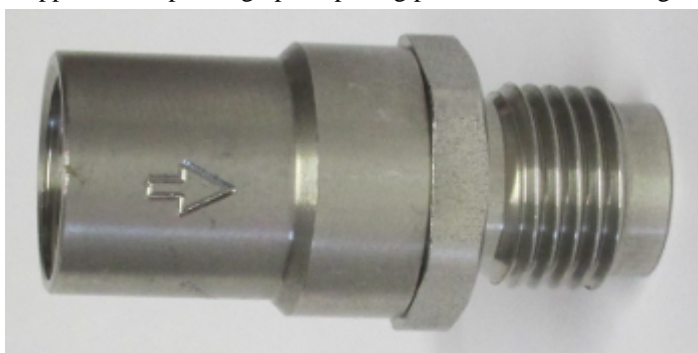
# Backstroke Valve BSV-2005 G1/4"

## 1. Introduction

The **APSON Backstroke Valve BSV-2005 G1/4"** *with flat seal* is an automatically switching compact plate valve made of inoxidable steel. As checkvalves they release the medium flow in a direction and lock it in opposite direction. They belong therefore to the group of the locking valves (DIN 24 300). APSON checkvalves ensure a particularly low-resistance medium flow through the stream-dynamical clean form of the interior.

## 2. Structure and Function

The sealing takes place via a spring-tensioned valve plate and sealing ring. The stroke delimiter assures a free outlet. The checkvalve is applicable depending upon opening pressure also as sucking and safety valve.



APSON Backstroke Valve BSV-2005 G1/4" with flat seal

## 3. Technical Data

Denomination	APSON Backstroke Valve BSV-2005 G1/4" (G1/4" in - G1/4" out)
Media	Lacquers, solvent, caustic solutions, air, a.o. (other media on customer's request)
Operating pressure	0.5 - 25 bar (or in accordance with customer's request)
Working pressure	0.3 bar (other operating pressures on customer's request)
Housing and valve seat	Inoxidable steel
Compression spring	Inoxidable steel
Seal	Kalrez™, (Zalak™ on customer's request)
Temperature range	-40 °C .. +100 °C

## 4. Ordering Data

Denomination	Part-Nr.
APSON Backstroke Valve BSV-2005 G1/4" with flat seal	100-A014-5

Options:

- Non-medium-touching housing parts from aluminum

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# Backstroke Valve BSV-2014 G1/4"

## 1. Introduction

APSON Backstroke Valves (Checkvalves) of above-mentioned type are automatically switching compact plate valves made of inoxidable steel. They release the medium flow in a direction and lock it in opposite direction. They belong therefore to the group of the locking valves (DIN 24 300). APSON checkvalves ensure a particularly low-resistance medium flow through the stream-dynamical clean form of the interior.

## 2. Structure and Function

The sealing takes place via a spring-tensioned valve plate and sealing ring. The stroke delimiter assures a free outlet. The checkvalve is applicable depending upon opening pressure also as sucking and safety valve.



APSON Checkvalve BSV-2014 G1/4"

## 3. Technical Data

Denomination	APSON Checkvalve BSV-2014 G1/4" (G1/4" in - G1/4" out)
Media	Lacquers, solvent, caustic solutions, air, a.o. (other media on customer's request)
Operating pressure	0.5 - 25 bar (or in accordance with customer's request)
Working pressure	0.3 bar (other operating pressures on customer's request)
Housing and valve seat	Inoxidable steel
Compression spring	Inoxidable steel
Seal	Kalrez™, (Zalak™ on customer's request)
Temperature range	-40 °C .. +100 °C

## 4. Ordering Data

Denomination	Part-Nr.
APSON Checkvalve BSV-2014 G1/4"	100-A001

Options:

- Non-medium-touching housing parts from aluminum

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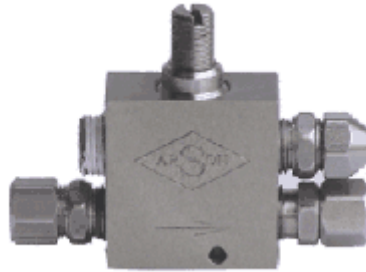
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## Part V. APSON Overpressure Valves

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# Overpressure Valve OPV-2000

## 1. Introduction

The APSON Overpressure Valve OPV-2000 is a mechanically adjustable, compact overpressure valve for aggressive liquid non-granular media, e.g. lacquers, solvents, caustic solutions, a.o. It is particularly suitable for the application in automatic painting systems for preventing loss of production times due to bursting of medium hoses subjected to pressure.



APSON Overpressure Valve OPV-2000

## 2. Features

- Rinsable overpressure space.
- Cost-saving, because the bursting of hoses is avoided.
- High throughput and very good rinsing barness.
- Simplest handling at assembling and maintenance.
- Deathroom-minimized space for the medium flow.

## 3. Structure and Function

The APSON Overpressure Valve OPV-2000 consists of

- a housing block with adjusting screw for the overpressure,
- an overpressure device (sealing seat with a ball subjected to a compression spring),
- a link for medium input and a link for medium output (lower links),
- a link for deriving the medium in the case of overpressure,
- a link for rinsing the overpressure valve and deriving hose.



APSON Overpressure Valve OPV-2000

The overpressure valve is preferably connected by means of double threaded nipples directly to the medium pump. It can be inserted however also flying to the medium tube of the pump output.

## 4. Technical Data

Denomination:	APSON Overpressure Valve OPV-2000
Over-pressure range:	adjustable from 2 to 25 bar
Media:	Lacquers, solvents, caustic solutions, a.o.
Materials:	<ul style="list-style-type: none"> <li>• housing from aluminum, anodized (or on customer's request)</li> <li>• seal material Teflon™ (or on customer's request)</li> <li>• overpressure adjusting nut made of inoxidable steel</li> </ul>
Medium links:	on customer's request
Dimensions (in mm):	<ul style="list-style-type: none"> <li>• without links: length 40, height 40 (55), depth 20</li> <li>• with links: length 89</li> </ul>
Mass:	approx. 50 g

## 5. Ordering Data

Denomination	Part-Nr.
APSON Overpressure Valve OPV-2000	100-A002

Options:

- Medium links, housing and seal material on customer's request

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## Part VI. APSON Sprayheads

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# Sprayhead SH-2000

## 1. Introduction

The APSON 4M Sprayhead SH-2000 for high rotation atomizers is a compact sprayhead with 4 medium valves. It is mainly designed for standard spindle turbines used in the industry, but can be manufactured also after customer's request.



APSON Sprayhead SH-2000 with valves and color tubing carrier (base-body, valves, color tubing carrier and hose couplings are to be ordered separately)

The APSON Sprayhead SH-2000 is particularly suitable for applications in automatic systems with aggressive media, e.g. lacquers, solvents, caustic solutions, a.o. Due to the construction and the high throughput it is very well rinsable and applicable for lacquers based on solvents, or on customer's request for water-based, metallic and filler lacquers equally well in roof and side machines.

## 2. Features

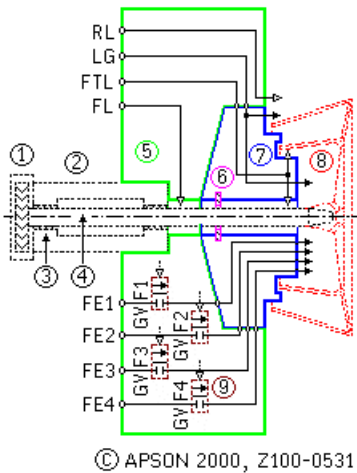
- Supply of up to 4 utilizable media **directly** in the sprayhead.
- Environmental carefully due to minimum consumption of utilizable medium.
- Environmental carefully due to shortest rinsing times.
- Cost-saving due to minimized consumption of rinsing medium.
- High throughput and very good rinsing barness.
- Simple handling when assembling and in maintenance.
- Deadthroomfree valves and media channels optimized for throughput and rinsing.

## 3. Structure and Function

The APSON Sprayhead SH-2000 consists of:

- Sprayhead base body and air shower body for the medium links and valves for the utilizable medium,
- Union nut for fastening the sprayhead body to the turbine case,

- Unscrewable air guidance ring within the front area,
- Exchangeable lacquer tubing carrier with unscrewable pneumatic air dissipator ring.



#### APSON Sprayhead SH-2000 - Operational Scheme

1=Turbine motor, 2=Turbine case, 3=Turbine bearings, 4=Turbine shaft, 5=Sprayhead body ,  
6=Disk seal, 7=Lacquer tubing carrier, 8=Atomizer/Bell, 9=Valves

The base body and the air shower body contain the drillings and threads for the circularly arranged utilizable medium valves and medium connections as well as the color tubing carrier. The color tubing carrier leads the utilizable media and the rinsing medium into the bell. Furthermore it prevents the penetration of liquid media into the front turbine bearing and supplies the bell with compressed air during the operation.

The seals and fixing bolts for the color tubing carrier are supplied in a separate spare-part/-seal package (see Ordering Data). To each utilizable medium valve (bell valve) GVF1 to GVF4 is assigned a utilizable medium entrance (color entrance) per FE1 to FE4. Additionally the sprayhead has still a vent hole and further four connections.

- RL - Connection for ring-air/guidance-air (Ringluft/Lenkluft), serves for shaping the spraying cone
- LG - Connection for solvent for the bell (Loesemittel fuer Glocke), serves for rinsing the spraying bell
- FTL - Connection for the lacquer tubing carrier cleanholding air (Farbrohrtraeger Freihalteluft) prevents getting the bell dirty
- FL - Connection for cleanholding air (Freihalteluft) prevents penetration of liquids into turbine bearings

## 4. Technical Data

Denomination:	APSON Sprayhead SH-2000
Media:	Lacquers, solvents, caustic solutions, a.o.
Media pressures:	max. 10 bar
Air pressures:	max. 12 bar
Materials:	Aluminum and brass (brass for the thread of the guidance-air dissipator)
Seals:	Viton compound™, or after customer's request
Dimensions (in mm):	Without valves and lacquer tubing carrier: D = 74.5; H = 99 With valves and lacquer tubing carrier: D = approx. 105, H = 114
Connections:	LG - Tubing screw (SL) connection* M5 for tube 4x6

	FL - Tubing plug-in connection* M5 for tube 2.7x4 FTL - Tubing plug-in connection* M5 for tube 2.7x4 RL - Tubing plug-in connection 1/8"-NPT for tube 6x8 FE1 to FE4 - Tubing screw (SL) connection G1/8" for tube 4x6 GVF1 to GVF4 - threads for APSON 2/2-Ways Valves * = Connections with PA sealing ring
Valves interfaces:	for APSON 2/2-Ways Valves, in accordance with Ordering Data
Color tubing carrier interface:	for APSON Lacquer Tubing Carrier, in accordance with Ordering Data
Fastening:	Union nut for turbine case, or after customer's request
Mass:	approx. 850 g, with union nut and union fittings, however without valves and color tubing carrier

## 5. Ordering Data

Denomination	Part-Nr.
APSON Sprayhead SH-2000, (without valves and lacquer tubing carrier)	100-0500
APSON 2/2-Ways Valve 2003 (accessory, 4 pieces)	060-A011
APSON Guidance air Ring for Sprayhead Body - sparepart	100-0498
APSON Union Nut for fastening to the Turbine Case - sparepart	100-0226
APSON Lacquer Tubing Carrier SHC-2000 for 4 media (accessory, 1 piece)	100-0499
APSON Pneumatic air dissipation Ring for Lacquer Tubing Carrier SHC-2000 - sparepart	100-0501
APSON Lacquer Tubing Carrier SHC-2000 for 4 media - sparepart package	300-0014

Options:

- Other dimensions for link and tubing screw connections
- Sprayhead with more than 4 media inputs on customer's request

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## Part VII. APSON High-Voltage Rings

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# High Voltage Ring HVR-2000 ø166

## 1. Introduction

The APSON High Voltage Ring HVR-2000 ø166 is a producer of high-voltage field with a housing inside diameter of 166 mm, for DC voltages up to -100 kV.



APSON High Voltage Ring HVR-2000 ø166

It is used as an auxiliary component for high rotation atomizers for the external loading of electrostatically chargeable media, e.g. for painting or for other electrostatic coatings.

The APSON High Voltage Ring HVR-2000 ø166 serves for the quality improvement and increase of the efficiency of coating processes.

Due to the design and the used materials it is easy to clean and therefore particularly well suitable to the employment in automatic systems for the processing of often to be changed aggressive media, e.g. lacquers on water basis, solvents, caustic solutions, a.o.

## 2. Features

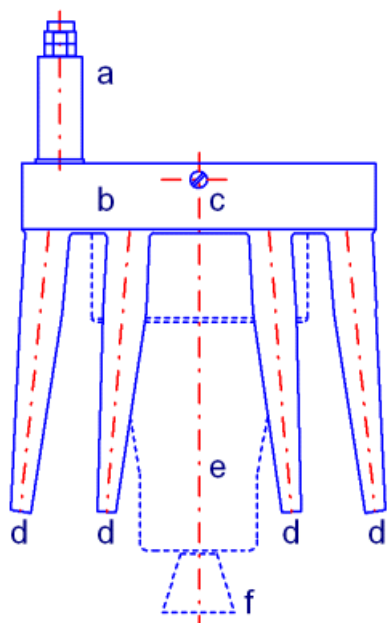
The APSON High Voltage Ring HVR-2000 ø166

- is environmental careful due to the high efficiency of the painting process,
- makes possible simple handling when assembling and maintenance,
- is easy to clean.

## 3. Structure

The APSON High Voltage Ring HVR-2000 ø166 consists mainly of

- a solid circular housing for the distribution of the high voltage,
- a high voltage connection with an axial connective opening for the high voltage cable,
- six candlelike high-voltage field producers with integrated delimiters of short circuit current.



APSON High Voltage Ring HVR-2000 ø166

a = high voltage connection, b = high voltage ring,

c = fixing bolt, d = high voltage candles (6),

e = turbine case, f = atomizer bell

The high voltage ring is attached at the housing of the high rotation atomizer by means of radially arranged fastening screw/s.

The high voltage connection is intended for high-voltage cables with diameter from 6 to 7 mm. As contact a banana plug with a soldered on Spax™-screw (see Technical Data) is screwed in into the end of the high-voltage cable.

## 4. Function

During the painting process the high voltage candles stay under negative DC voltage, e.g. -75 kV. The atomizer bell of the high rotation atomizer as well as that application object to be coated are at earth potential (0 V).

Between the candle tips on the one hand, and the bell and application object on the other hand, develops an electrical field.

During the painting process the lacquer fog formed by the high rotation atomizer flows through the electrical field and is negatively charged. The positive potential of the application object causes, that a high portion of the lacquer fog covers the application object evenly.

## 5. Technical Data

Denomination:	APSON High Voltage Ring HVR-2000 ø166
Media:	Water-based lacquers, solvents, caustic solutions, a.o.
High Voltage (HV):	max. -100 kV DC voltage
HV contact:	Bananaplug ø4 mm with soldered Spax™-screw M2.5x16, type S, galvanized
Dimensions:	Ring inside diameter 166 mm, max. candle wreath-ring outside diameter 265 mm, overall height 320 mm
Mass:	approx. 2.6 kg

## 6. Ordering Data

Denomination	Quantity	Part-Nr.
APSON High Voltage Ring HVR-2000 ø166	1	130-A006
APSON SparepartPackage for HVR-2000	1	300-0019
APSON High Voltage Fat (tube a 100 g)	1	200-0260

Options:

- Other materials or features on customer's request

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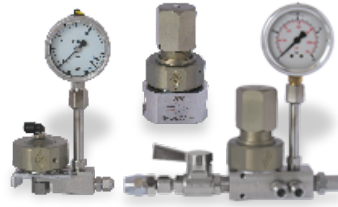
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## Part VIII. APSON Pressure Regulators

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# Lacquer Pressure Regulator PRP-2001, pneumatic

## 1. Introduction

The APSON Lacquer Pressure Regulator PRP-2001 is a pneumatically controllable pressure regulator for often to be changed aggressive media. It is particularly optimized for good rinsing barness and small solvent consumption. Therefore it is particularly suitable to the application in automatic systems for the processing of lacquers, solvents, caustic solutions, a.o.



APSON Lacquer Pressure Regulator PRP-2001

## 2. Features

- Environmental carefully due to short rinsing times.
- Very good rinsing barness and small solvent consumption.
- Small pressure losses.
- Increased security due to application of a double diaphragm.
- Rational maintenance and spareparts holding.
- Very fast exchange of a defective double diaphragm (2 minutes).
- Simplest handling at assembling, adjustment and maintenance.
- Small, compact size.

## 3. Structure and Function

The APSON Lacquer Pressure Regulator PRP-2001 is equipped with a spacer ring with two diaphragms, a medium diaphragm and a pneumatic air diaphragm. The gap thus developing between the diaphragms has an outlet and serves for safety. The double diaphragm separates the control pneumatic air from the medium.

The regulator keeps the medium pressure at the output constant and independent of pressure fluctuations of the medium supply system at the input of the pressure regulator, if the medium input pressure is higher than the preset required medium output pressure.



APSON Lacquer Pressure Regulator PRP-2001

If a damage to the medium diaphragm takes place with still perfect control air diaphragm, then the *medium* penetrating into the diaphragm gap is derived by the outlet of the intermediate spacer ring.

If a damage to the control air diaphragm takes place with still perfect medium diaphragm, then *control air* penetrating into the diaphragm gap is derived by the outlet of the intermediate spacer ring.

At normal operation of the pressure regulator, penetration of medium into the pneumatics system can be prevented even with defective medium diaphragm. Due to the fluidodynamical clean interior geometry of the pressure regulator, a very short rinsing procedure time is achieved.

The desired medium pressure at the output of the pressure regulator is adjusted pneumatically with the control air pressure. The regulation procedure is achieved through the equilibrium of the force produced by the control air pressure on one hand, and the force produced by the medium pressure together with the strength of the recoil spring in the supply drilling of the medium chamber on the other hand. For rinsing of the pressure regulator, the control air pressure must be set to a pre-determined value, so that the throttle in the supply drilling is fully opened.

**Important:** When exchanging the diaphragms it is to be made certain that the Teflon™-coated surface of the diaphragms point both into the direction of the medium space.

## 4. Technical Data

Denomination:	APSON Lacquer Pressure Regulator PRP-2001
Media:	Lacquers, solvents, caustic solutions, a.o.
Medium pressure input:	max. 10 bar (dependent on the control air pressure)
Operating pressure output:	0 to 8 bar
Control air pressure:	0 to 10 bar (dependent on the medium pressure at the input)
Materials:	<ul style="list-style-type: none"> <li>• Medium-touching sections made of inoxidable steel</li> <li>• Union nut, spacer ring and cover part from aluminum, hardcoated</li> <li>• Diaphragms from rubber with fabric proportion, Teflon™-coated</li> </ul>
Control air link:	G1/8"
Medium links:	G1/4"
Spacer gap outlet:	Drilling with M5 thread (see Ordering-Options)
Dimensions:	<ul style="list-style-type: none"> <li>• Without links: ø57 mm, height 66 mm</li> <li>• With medium links: width 84 mm, height 89 mm</li> </ul>
Mass:	approx. 260 g

## 5. Ordering Data

Denomination	Part-Nr.
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APSON Lacquer Pressure Regulator PRP-2001 with normal diaphragm	040-A002
APSON Lacquer Pressure Regulator PRP-2001 with waved diaphragm and low hysteresis	040-A005
APSON Lacquer Pressure Regulator Key (wrench width 54 mm)	100-0105

Options:

- All aluminum sections made of inoxidable steel
- Spacer gap outlet link M5 for hose D = 4 mm, d = 3 mm

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# Lacquer Pressure Regulator PRM-2000, mechanic

## 1. Introduction

The APSON Lacquer Pressure Regulator PRM-2000 is a *mechanically* controllable pressure regulator for often changing aggressive media. It keeps the media pressure at the exit constant and independent of the pressure fluctuations of the medium supply system at the entrance of the regulator, if the input pressure is larger than the preset exit pressure.

The regulator is particularly optimized for good rinsing barness and small solvent consumption. Therefore it is particularly suitable to the employment in automatic systems for the processing of lacquers, solvents, caustic solutions, a.o.



APSON Lacquer Pressure Regulator PRM-2000

## 2. Features

- Environmental carefully due to short rinsing times.
- Very good rinsing barness and small solvent consumption.
- Small pressure losses.
- Rational maintenance and spareparts holding.
- Very fast exchange of a defective diaphragm (2 minutes).
- Simplest handling at assembling, adjustment and maintenance.
- Small, compact size.

## 3. Structure and Function

The APSON Lacquer Pressure Regulator PRM-2000 consists of a medium pressure space, which is separated from the compression spring space by means of a solvent-resistant diaphragm. The diaphragm is subjected on one side with the pressure of the to be regulated medium and on the other side with the force of the manually adjustable compression spring.



A thrust piece connected with the diaphragm controls the medium quantity per time unit, flowing through the pressure regulator, via a throttle provided with a ball. The regulation procedure is achieved through the equilibrium of the force between the compression spring on one hand, and by the resulting strength due to the medium pressure together with the force of the recoil spring in the supply drilling of the throttle on the other hand.

The desired medium pressure at the output of the regulator is adjusted mechanically by means of manually adjusting the nut of the regulator. For rinsing of the pressure regulator the adjusting nut must be set to a pre-determined value, so that the throttle is fully opened.

**Important:** When exchanging the diaphragm it is to be made certain that the Teflon™-coated surface of the diaphragm points into the direction of the medium space.

## 4. Technical Data

Denomination:	APSON Lacquer Pressure Regulator PRM-2000
Media:	Lacquers, solvents, caustic solutions, a.o.
Medium pressure input:	max. 10 bar
Operating pressure output:	0 to 8 bar
Materials:	<ul style="list-style-type: none"> <li>• Medium-touching sections made of inoxidable steel.</li> <li>• Union nut and cover part from aluminum, hardcoated.</li> <li>• Diaphragm from rubber with fabric proportion, Teflon™-coated.</li> </ul>
Medium links:	G1/4"
Dimensions:	Diameter 57 mm, Height 130 mm
Mass:	approx. 420 g

## 5. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Pressure Regulator PRM-2000	040-A001
APSON Lacquer Pressure Regulator Key (wrench width 54 mm)	100-0105

Options:

- All aluminum sections made of inoxidable steel

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# Lacquer Pressure Regulator PRM-2015, mechanical

## 1. Introduction

The **APSON Lacquer Pressure Regulator PRM-2015** is a *mechanically* controllable pressure regulator for often changing aggressive media. It has 5 integrated outlets and keeps the media pressure at the outlets constant and independent of the pressure fluctuations of the medium supply system at the entrance of the regulator, if the input pressure is larger than the preset exit pressure.

The regulator is particularly optimized for good rinsing barness and small solvent consumption. Therefore it is particularly suitable to the employment in automatic systems for the processing of lacquers, solvents, caustic solutions, a.o.



APSON Lacquer Pressure Regulator PRM-2015

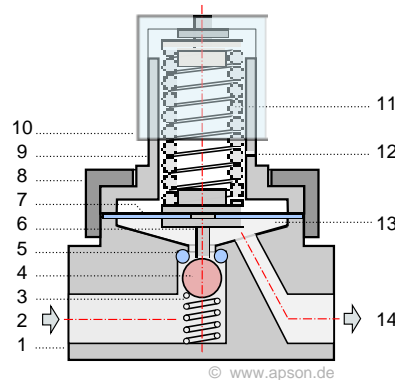
## 2. Features

- Environmental carefully due to short rinsing times.
- Very good rinsing barness and small solvent consumption.
- Small pressure losses.
- Rational maintenance and spareparts holding.

- Very fast exchange of a defective diaphragm (2 minutes).
- Simplest handling at assembling, adjustment and maintenance.
- Small, compact size.

### 3. Structure and Function

The **APSON Lacquer Pressure Regulator PRM-2015** consists of a pressure chamber, which is separated from the main spring chamber by means of a solvent-resistant diaphragm. The diaphragm is subjected on one side with the pressure of the to be regulated medium and on the other side with the force of the manually adjustable main spring.



**Legend:** 1 = Lower casing part, 2 = Inlet, 3 = Recoil spring, 4 = Sealing ball, 5 = Sealing ring, 6 = Thrust piece, 7 = Diaphragm, 8 = Overthrow nut, 9 = Upper casing part, 10 = Adjustment nut, 11 = Main spring, 12 = Vent hole, 13 = Pressure chamber, 14 = Outlet/s.

The thrust piece connected with the diaphragm controls the medium quantity per time unit, flowing through the pressure regulator, via the throttle provided with the sealing ball. The regulation procedure is achieved through the equilibrium of the force between the main spring on one side, and on the other side by the resulting force due to the medium pressure together with the force of the recoil spring in the supply bore of the throttle.

The desired medium pressure at the outlet of the regulator is adjusted by manually rotating the adjustment nut of the regulator. For rinsing of the pressure regulator the adjustment nut must be set to a pre-determined value, so that the throttle is fully opened.

**Important:** The pressure regulator is to be operated normally in vertical position, to be effective cleanable resp. when decantable media (e. g. metallic lacquers) are to be processed. An eventual manometer is always to be operated in vertical position, because of the gas column in the rising tube.

**Important:** When exchanging the diaphragm it is to be made certain that the Teflon™-coated surface of the diaphragm points into the direction of the medium chamber.

### 4. Technical Data

<b>Denomination:</b>	<b>APSON Lacquer Pressure Regulator PRM-2015</b>
Media:	Lacquers, solvents, caustic solutions, a.o.
Medium pressure input:	max. 10 bar
Operating pressure output:	0 to 8 bar
Outlets:	5
Materials:	<ul style="list-style-type: none"> <li>• Medium-touching sections made of inoxidable steel.</li> <li>• Union nut and cover part from aluminum, hardcoated.</li> <li>• Diaphragm from rubber with fabric proportion, Teflon™-coated.</li> </ul>

Medium links:	G1/4"
Dimensions:	Diameter 57 mm, Height 130 mm
Mass:	approx. 450 g

## 5. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Pressure Regulator PRM-2015	040-A021
APSON Lacquer Pressure Regulator Key (wrench width 54 mm)	100-0105

Options:

- All aluminum sections made of inoxidable steel

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# Lacquer Pressure Regulator PRM-2017, mechanical

## 1. Introduction

The **APSON Lacquer Pressure Regulator PRM-2017** is a *mechanically* controllable pressure regulator for often changing aggressive media. In comparison to PRM-2015, it has an approx. 35% larger throughput and a longer housing. It has 5 integrated outputs and keeps the pressure of the medium at the outlets constant and independent of the pressure fluctuations of the medium supply system at the input of the regulator, if the input pressure is larger than the preset output pressure.

The regulator is particularly optimized for good rinsing barness and small solvent consumption. Therefore it is particularly suitable to the employment in automatic systems for the processing of lacquers, solvents, caustic solutions, a.o.

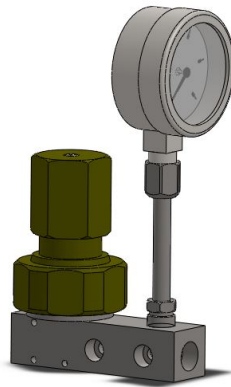


Fig. 1: APSON Lacquer Pressure Regulator PRM-2017

## 2. Features

- Environmental carefully due to short rinsing times.
- Very good rinsing barness and small solvent consumption.
- Compact design, large throughput and small pressure losses.
- Very fast exchange of a defective diaphragm (2 minutes).
- Simplest handling at assembling, adjustment and maintenance.
- Rational maintenance and spareparts holding.

## 3. Structure and Function

The **APSON Lacquer Pressure Regulator PRM-2017** consists of a pressure chamber, which is separated from the main spring chamber by means of a solvent-resistant diaphragm. The diaphragm is subjected on one side with the pressure of the to be regulated medium and on the other side with the force of the manually adjustable main spring.

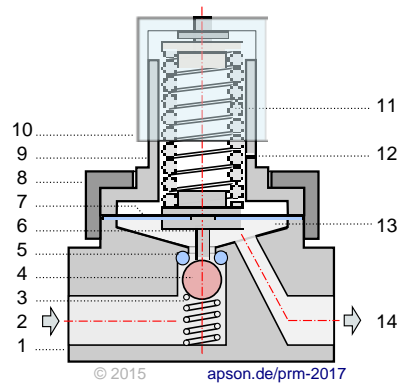


Fig. 2: APSON Lacquer Pressure Regulator PRM-2017 - Structure

**Legend:** 1 = Lower casing part, 2 = Input, 3 = Recoil spring, 4 = Sealing ball, 5 = Sealing ring, 6 = Thrust piece, 7 = Diaphragm, 8 = Overthrow nut, 9 = Upper casing part, 10 = Adjustment nut, 11 = Main spring, 12 = Vent hole, 13 = Pressure chamber, 14 = Output/s.

The thrust piece connected with the diaphragm controls the medium quantity per time unit, flowing through the pressure regulator, via the throttle provided with the sealing ball. The regulation procedure is achieved through the equilibrium of the force between the main spring on one side, and on the other side by the resulting force due to the medium pressure together with the force of the recoil spring in the supply bore of the throttle.

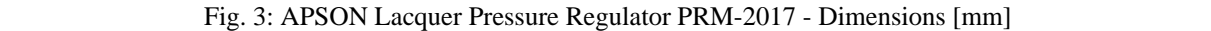
The desired medium pressure at the outlet of the regulator is adjusted by manually rotating the adjustment nut of the regulator. For rinsing of the pressure regulator the adjustment nut must be set to a pre-determined value, so that the throttle is fully opened.

**Important:** The pressure regulator is to be operated normally in vertical position, to be effective cleanable resp. when decantable media (e. g. metallic lacquers) are to be processed. An eventual manometer is always to be operated in vertical position, because of the gas column in the rising tube.

**Important:** When exchanging the diaphragm it is to be made certain that the Teflon™-coated surface of the diaphragm points into the direction of the medium chamber.

## 4. Technical Data

<b>Denomination:</b>	<b>APSON Lacquer Pressure Regulator PRM-2017</b>
Media:	Lacquers, solvents, alkalis, a.o.
Medium pressure input:	max. 10 bar
Operating pressure output:	0 to 8 bar
Connections:	6 (1 input, 5 outputs)
Materials:	Medium-touching parts made of inoxidable steel. Union nut and cover part from aluminum, hardcoated. Diaphragm from rubber with fabric proportion, Teflon™-coated.
Mass:	approx. 650 g



## 5. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Pressure Regulator PRM-2017	040-A021-3E
APSON Lacquer Pressure Regulator Key (wrench width 54 mm)	100-0105

Options:

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# Lacquer Pressure Regulator PRP-2023-R, pneumatic, backflushable

## 1. Introduction

The **APSON Lacquer Pressure Regulator PRP-2023-R** is a *pneumatically controllable and backwards flushable flow-through regulator* for aggressive viscous media, e.g. paints, solvents, alkalis, a.o. Because of the design, it allows before the flushing process to *recover medium*, not only by pushing forward, but also by pushing medium backwards. This regulator type is optimized for good rinsing barness and small solvent consumption. Therefore it is particularly suitable to the employment in automatic systems.



Fig. 1: APSON Lacquer Pressure Regulator PRP-2023-R

## 2. Features

- As well forward as backward flushable.
- Environmental carefully due to short rinsing times.
- Very good rinsing barness and small solvent consumption.
- Compact design, large throughput and small pressure losses.
- Very fast exchange of a defective diaphragm (2 minutes).
- Simple handling at assembling, adjustment and maintenance.

## 3. Structure and Function

The **APSON Lacquer Pressure Regulator PRP-2023-R** (see Fig. 2) consists mainly of a housing (4, 21, 22) with medium input 1 and throttle valve (3, 5, 6), lacquer chamber 26, two solvent-resistant diaphragms (8, 10) connected by spacer ring 9 and thrust piece (7, 11, 12), as well as the pneumatic chamber 23. The indicator unit 13 allows to monitor or to manually control the regulation process.

The diaphragms are subjected on one side with the pressure of the to be regulated medium 26 and on the other side with the pressure of the pneumatical control air 23. Pressure variations at the input of the controller are smoothed by this construction.

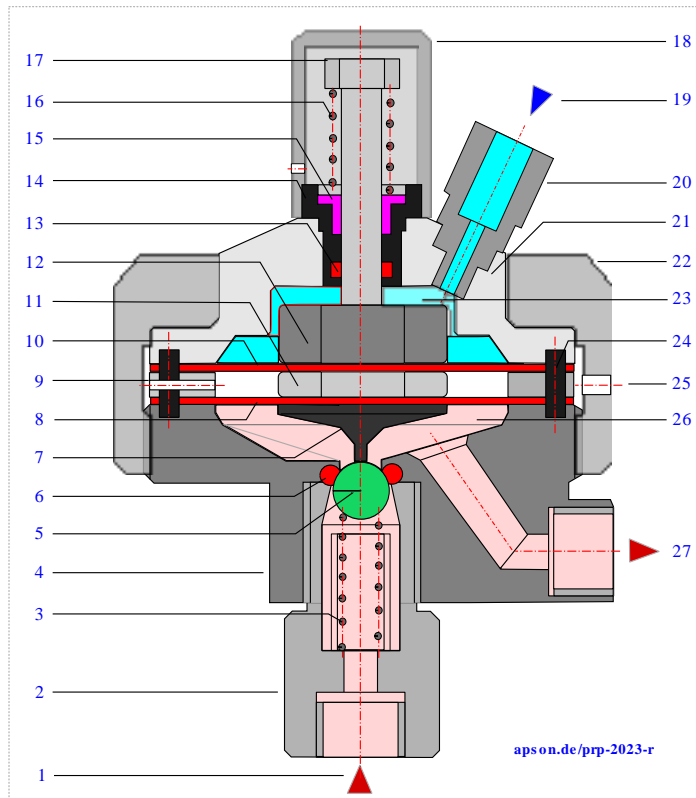


Fig. 2: APSON Lacquer Pressure Regulator PRP-2023-R -- Structure

**Legend:** 1 = Medium input, 2 = Input connector, 3 = Closing spring, 4 = Lower casing part, 5 = Sealing ball, 6 = Sealing ring, 7 = Thrust piece, 8 = Medium diaphragm, 9 = Spacer ring, with vent hole, 10 = Pressure air diaphragm, 11 = Spacer nut, 12 = End nut, 13 = Sealing ring, 14 = Indicator unit, 15 = Slide bush, 16 = Compression spring, 17 = Indicator pin, 18 = Indicator cap (optional), 19 = Pneumatic input, 20 = Plug-in connection, 21 = Upper casing part, 22 = Overthrow nut, 23 = Pneumatic chamber, 24 = Centering pin, 25 = Vent hole, 26 = Lacquer chamber, 27 = Medium output.

The thrust piece connected with the diaphragms controls the medium quantity per time unit, flowing through the pressure regulator, via the throttle provided with the sealing ball. The regulation procedure is achieved through the equilibrium of the forces between the pneumatic pressure on one side, and on the other side by the resulting force due to the medium pressure together with the force of the recoil spring in the supply bore of the throttle.

The desired medium pressure at the outlet of the regulator is adjusted pneumatically via pressure air at the pneumatic input of the regulator. For backward flushing of the pressure regulator, the control air must be set approximately to the pressure of the flushing medium.

**Important:** APSON Lacquer Pressure Regulators are robust in-stream flow-through regulators for viscous media. Any calibrations and measurements are to be run only when the medium *actively streams through* the regulator. When exchanging the diaphragms it is to be made certain that the Teflon™-coated surface of the diaphragm points into the direction of the medium.

## 4. Technical Data

Denomination:	APSON Lacquer Pressure Regulator PRP-2023-R
Media:	Lacquers, solvents, alkalis, a.o.
Medium pressure input:	max. 25 bar

Flushing pressure:	max. 12 bar
Operating pressure range, at the output:	approx. 0 to 20 bar (best results in the upper third of the operating range)
Connections:	1 lacquer input G1/4", 1 lacquer output G1/4", 1 pneumatic input G1/8"
Materials:	Medium-touching parts made of inoxidable steel. Union nut and cover part from aluminum, hardcoated. Diaphragms from rubber with fabric proportion, Teflon™-coated.
Dimensions [mm]:	Height 80, Diameter 57, Length 60
Mass:	approx. 330 g

## 5. Ordering Data

Denomination	Part-Nr.
APSON Lacquer Pressure Regulator PRP-2023-R, with indicator unit	040-A005-R4
APSON Lacquer Pressure Regulator Key (wrench width 54 mm)	100-0105

Options: All aluminum parts made of inoxidable steel.

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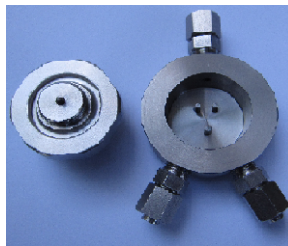
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# Mini Paint Pressure Regulator PRP-3001-PF, pneumatic

## 1. Introduction

The **APSON Mini Paint Pressure Regulator PRP-3001-PF** is a pneumatically controllable pressure regulator for the processing of often to change aggressive media, e.g. paints, solvents, alkalis. The regulator is optimized for good rinsing and low solvent consumption. Due to its adapter interface it is very quickly interchangeable and is particularly suitable for highly available automated systems.



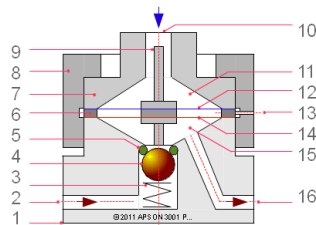
APSON Mini Paint Pressure Regulator PRP-3001-PF, with Quick-Adapter

## 2. Performance Characteristics

- Compact size, small and light. Low pressure loss.
- Environmentally friendly due to very good rinsability, low solvent consumption.
- Very fast exchange in case of defect: Controller, 1 minute; Double membrane, 2 minutes.
- Very easy handling during installation, adjustment and maintenance.
- Increased safety due to use of a double membrane.
- Efficient maintenance and spare parts.

## 3. Structure and Function

The **APSON Mini Paint Pressure Regulator PRP-3001-PF** comprises a housing 1, a housing cover 7, a union nut 8 and a double membrane. This consists of control air diaphragm 12, medium-diaphragm 14, and spacer ring 6. The membranes interspace has an discharge output 13 as a safety device.



APSON Mini Paint Pressure Regulator PRP-3001-PF – Functioning Scheme

The double membrane separates the control air space 11 from the medium space 15. The regulator keeps the medium-pressure at the outlet 16 constant and unaffected by pressure fluctuations of the medium supply system at the input 2 of the regulator, if the input pressure is greater than the pneumatically preset output pressure.

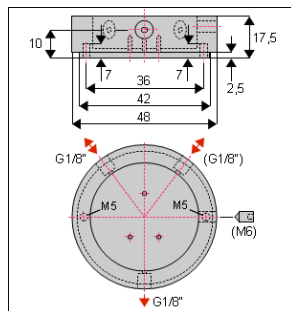
*In case a damage occurs to the medium-membrane 14 at even perfect control air-membrane 12, then the penetrating medium is discharged from the membranes interspace through the orifice 13. In case a damage occurs to the*

*control air-membrane 12* at even perfect medium-membrane 14, then the penetration air is discharged from the membranes interspace through the orifice 13. When the regulator is properly operated, thus the penetration of the medium into the pneumatic system can be prevented. Due to the hydrodynamic flow geometry of the regulator's interior, a very short rinsing cycle is achieved.

The desired fluid pressure at the outlet of the regulator is pneumatically controlled through the air pressure set on the pneumatic input 10. Thereby, the pressure piece 9 of the double membrane acts on the sealing ball 4 and opens the sealing seat, more or less. The regulation process is determined by the pressure balance of control air pressure on one side and medium pressure on the other side, together with the force of the closing spring 3 in the supply bore. To rinse the pressure regulator, the control air pressure is to be brought to a predetermined value, so that the valve seat between sealing ring 5 and sealing ball 4 is fully open.

**Important:** When replacing the membranes, make sure that the Teflon™-coated surface of the respective membranes are mounted facing towards the medium compartment 15.

## 4. Quick-Adapter – Mounting Data



## 5. Technical Data

Designation:	APSON Mini Paint Pressure Regulator PRP-3001-PF
Media:	Paints, solvents, alkalis, a.o.
Medium Pressure, at input:	Max 15 bar (depending on the control air pressure)
Working pressure, at output:	Approx. 0 to 15 bar. (Note: At low pressure the hysteresis effects of the membrane should be considered.)
Control air pressure:	0 to 15 bar (depending on the medium pressure at the input)
Medium wetted parts:	Stainless steel *
Nut, spacer ring and cover:	Aluminium, hard coated *
Membranes:	Rubber with fabric, Teflon™-coated *
Control air connection:	Hole on the housing cover, with M5 thread
Medium connection:	3 times G1/8" on the adapter: 2 pass through, 1 output
Discharge outlet:	Hole in the nut, with M5 thread
Dimensions without adapter:	Ø 38 mm, height 33 mm
Dim. with adapter, L x W x H:	900 x 52 x 52 mm (inclusive connectors)
Mass:	If all metal parts made of stainless steel; regulator approx. 115 g, adapter approx. 190 g

\* Or according to customer specifications.

## 6. Ordering Data

Designation	Ordering Number
-------------	-----------------

APSON Mini Paint Pressure Regulator PRP-3001-PF, with normal membrane	040A035-1
APSON Mini Paint Pressure Regulator PRP-3001-PF, with ondulated membrane (lesser hysteresis)	040A035-2
APSON Mini Paint Pressure Regulator PRP-3001-PF wrench (36 mm)	100A1383

Options: All parts also according to customer specifications.

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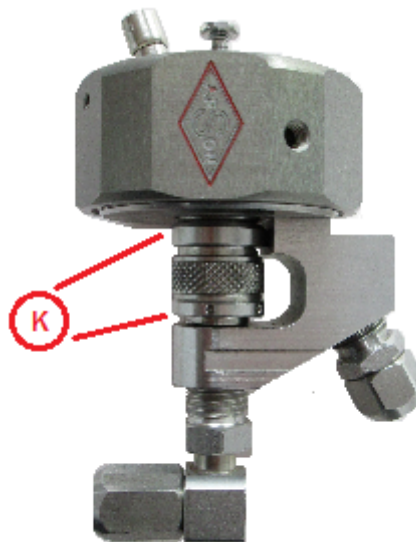


# Quickchange Paint Pressure Regulator PRP-3030-K, with Cartridge and Regulation Indicator

## 1. Introduction

The APSON Quickchange Paint Pressure Regulators PRP-3030-K are *pneumatically* controlled or *mechanically* adjustable regulators with a replaceable regulation cartridge. and with mechanical regulation indicator. These types of regulators are used everywhere, where *downtimes in operation are very critical* and / or one wants *to change ad hoc the characteristic* of an already installed regulator.

The cartridge is available either a cost-effective repair solution, made of stainless steel, or as a disposable solution, made of plastic.



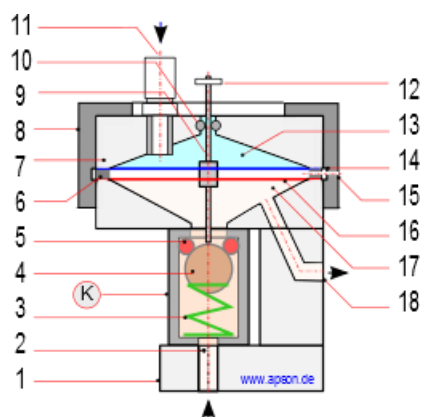
APSON Quickchange Paint Pressure Regulator PRP-3030-K (P=pneumatic)

## 2. Performance Characteristics

- Quick replaceable regulator cartridge.
- Different regulator characteristics in the same footprint.
- Fast and reproducible regulation.
- Environmentally friendly because very well flushable.
- Easily exchangeable membrane/s.
- Mechanical regulation indicator.

### 3. Structure and Function

The *mechanical* and *pneumatic* regulators are provided each with a replaceable regulation cartridge K. There are several cartridge types depending on lacquer throughput. To replace the cartridge, the regulator is to be switched to zero pressure and the knurled nut of the cartridge is to be loosened. Then the axial thrust piece in prolongation with the regulation indicator is to be pulled out about 4 mm with the removal support, for the cartridge to be removed resp. replaced.



APSON Quickchange Paint Pressure Regulator PRP-3030-K - Functioning-Scheme

**Legend:** 1=housing, 2=paint input, 3=spring, 4=sealing ball, 5=sealing ring, 6=spacer ring, 7=lid, 8=nut, 9=thrust piece, 10=sealing ring, 11=control air input, 12=regulation indicator, 13=control air space, 14=control air membrane, 15=leakage indicator, 16=paint membrane, 17=paint space, 18=lacquer outlet.

### 4. Technical Data

Designation:	APSON Quickchange Paint Pressure Regulator PRP-3030-K (P=pneumatical) resp. PRM-3030-K (M=mechanical)
Working materials:	Solvent- and waterborne lacquers, solvents, alkalis, a.o.
Working material pressure at input:	max. 10 bar (KP: dependent on control air pressure)
Working material pressure at outlet:	approx. 0 - 8 bar, or according to client specification
Control air pressure, for KP:	approx. 0 - 10 bar, or according to client specification
Throughputs, depending on the cartridge type (water, l/min at 5 bar and maximal opened regulator valve):	KTk = Little throughput, approx. 0.7 l/min, KTS = Standard throughput, approx 1.0 l/min, KTG = Large throughput, approx. 1.4 l/min
Materials:	Working material contacting parts made of stainless steel. Nut, spacer and lid made of aluminum, hard anodized. Membranes made of rubber with fabric, Teflon™-coated. Cartridge, stainless steel 4305 or disposable cartridge made of plastic.
Connection thread:	Control air: G1/8"; Working material: G1/4"
Leakage indicator:	Borehole with thread M5
Dimensions, with connectors:	KP: Width: ~ 75 mm, Height: ~ 90 mm KM: Width: ~ 75 mm, Height: ~ 135 mm
Mass:	KP: ~ 290 g; KM: ~ 440 g (without manometer)

## 5. Ordering Data

Designation	Ordering number
APSON Quickchange Paint Pressure Regulator PRP-3030-K (P=pneumatical)	040-A053
APSON Quickchange Paint Pressure Regulator PRM-3030-K (M=mechanical)	040-A054
APSON Quickchange cartridge PRKK-3030 (K=little throughput)	040-A055
APSON Quickchange cartridge PRKS-3030 (S=standard throughput)	040-A056
APSON Quickchange cartridge PRKG-3030 (G=large throughput)	040-A057
APSON Paint Pressure Regulator Membrane	200-A265
APSON Paint Pressure Regulator Wrench (size 54 mm)	100-0105

Options: According to client specifications.

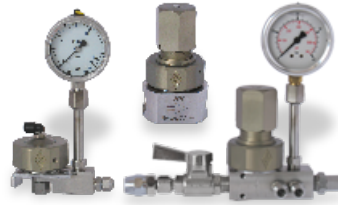
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# Part IX. APSON Backflow Controlvalves

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# Backflow Controlvalve BCV-2002-M, Mechanical

## 1. Introduction

The APSON Backflow Controlvalve BCV-2002-M is a *mechanically* adjustable overpressure valve for large throughput. It is particularly suitable for aggressive media, e.g. lacquers, solvents, caustic solutions, a.o.

The controlvalve releases the flow to the output, as long as the medium pressure at the input exceeds a manually preset value. It is specially optimized for good rinsing barness and is particularly suitable for the application in painting plants, for lacquer backflow-pressure adjustment or as dynamic bypass in automatic systems.



Backflow Controlvalve BCV-2002-M

## 2. Structure and Function

The APSON Backflow Controlvalve BCV-2002-M consists of a medium pressure chamber, which is separate from the compression spring chamber by means of a solvent-resistant diaphragm. The diaphragm is subjected on the Teflon™-coated side by the medium under pressure which has to be controlled and on the other side by the compression spring.

A sealing stamp connected with the diaphragm opens, as long as medium over-pressure at the input prevails. The desired medium pressure at the output of the backflow controlvalve is adjusted mechanically by means of the adjusting nut. For rinsing the backflow controlvalve, the compression spring must be relieved. In order to manage this, the adjusting nut is to be turned to the left (counter clockwise direction).

**Importantly:** When exchanging the diaphragm it is to be made certain that the Teflon™- coated surface of the diaphragm points to the medium side. The backflow controlvalve is to be installed preferably with the diaphragm in horizontal plane.

## 3. Features

- Environmental carefully due to short rinsing times.
- Good rinsing barness and small solvent consumption.
- Small pressure losses.
- Rational maintenance and holding of spareparts.
- Very fast exchange of a defective diaphragm (2 minutes).
- Simplest handling at assembling, adjustment and maintenance.

- Small, very compact size.

## 4. Technical Data

Denomination:	APSON Backflow Controlvalve BCV-2002-M
Media:	Lacquers, solvents, caustic solutions, a.o.
Working pressure range:	up to 12 bar
Flow rate:	to 47 l/min.
Materials:	<ul style="list-style-type: none"> <li>• Medium-touching sections made of inoxidable steel.</li> <li>• Union nut and cover from aluminum, hardcoated.</li> <li>• Diaphragm from rubber with fabric proportion, Teflon™-coated.</li> </ul>
Medium links:	G3/4"
Dimensions:	Diameter 69 mm, Height 110 mm
Mass:	approx. 500 g

## 5. Ordering Data

Denomination	Part-Nr.
APSON Backflow Controlvalve BCV-2002-M	040-A004
APSON Backflow Controlvalve Key (wrench width 54 mm)	100-0105

Options:

- All aluminum parts made of inoxidable steel

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# Backflow Control Valve BCV-2011-P, Pneumatically

## 1. Introduction

The **APSON Backflow Control Valve BCV-2011-P** is a *pneumatically* adjustable pressure relief valve. It is particularly suitable for aggressive media, e.g. varnishes, solvents, alkalis, a.o. The control valve releases the flow to the output as long as the medium pressure at the input exceeds a preset value. It is optimized for good rinsing and is intended for use in painting plants, for lacquer back pressure control or as a dynamic bypass in automatic systems.

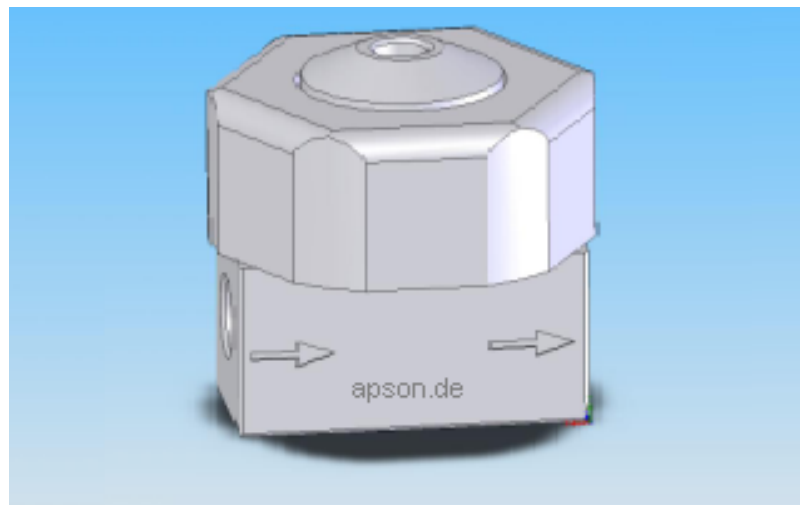


Fig. 1: APSON Backflow Control Valve BCV-2011-P

## 2. Features

- Environmental carefully due to short rinsing times.
- Good rinsing and low solvent consumption.
- Efficient maintenance and spare parts inventory.
- Very fast replacement of a defective diaphragm (approx. 2 minutes).
- Easy handling during installation, adjustment and maintenance.
- Very compact design.

## 3. Structure and Function

The **APSON Backflow Control Valve BCV-2011-P** is equipped with a spacer ring **D** and two ondulated membranes (diaphragms), a medium membrane **MM** and a control air membrane **PM** (see Fig. 2). The resulting gap space between ring and membranes has a radial output **S**. It is used as a safety device. The double diaphragm separates the control air from the use medium and is equipped with a sealing piston **K**. The backflow control valve keeps the medium pressure at the inlet (!) constant and independent of pressure changes of the medium-supply system as long as the force acting on the piston **K** force due to the medium pressure at the input is greater than the opposing force acting on the piston due to the pneumatic pressure.

In the **Normal Case resp. Normal Mode**, the input and the output result according to the arrow direction. For special applications with higher working pressures the **APSON Back Flow Control Valve BCV-2011-P** can also be operated in **Inverse Mode** (input and output against the arrow).

Occurs a **damage to the medium membrane MM** at still perfect control air membrane, then the use medium penetrating the membranes interspace is derived through the discharge opening S. Occurs a **damage to the control air membrane PM** at still perfect medium membrane, then the control air penetrating into the membranes interspace is discharged through the outflow opening S of the interspace.

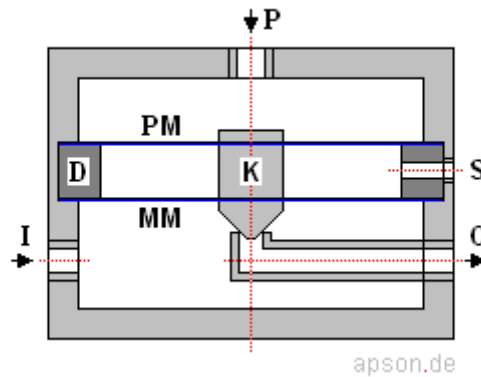


Fig. 2: APSON Backflow Control Valve BCV-2011-P -- Functional Scheme

With proper operation of the control valve, the advance of use medium into the pneumatic system can be prevented in case of failure. The flow geometry of the valve interior gives a very brief rinse. The desired pressure of the use medium at the input of the control valve is adjusted by means of pneumatic control air pressure.

**Note:** When replacing a diaphragm, make sure that the Teflon™-coated surface of the diaphragm is mounted towards the use medium.

## 4. Technical Data

Designation:	APSON Backflow Control Valve BCV-2011-P
Use media:	Lacquers, solvents, alkalis, a.o.
Maximum working pressure:	Normal Mode: 12 bar, Inverse Mode: 20 bar
Max. throughput (with water):	Normal Mode: 20 l/min, Inverse Mode: 30 l/min
Materials:	Wetted parts are stainless steel. Nut and cap made of high-strength aluminum, hard anodized. Membranes made of rubber with fabric portion, Teflon™-coated.
Pneumatic connection:	G1/8"
Use media connections:	G1/4" with 90° sealing cone
Dimensions:	Diameter 57 mm, height 66 mm
Mass:	Approx. 270 g

## 5. Ordering Data

Designation	Ordering Nr.
APSON Backflow Control Valve BCV-2011-P	040-A027E
APSON Spare parts / consumable package for APSON BCV-2011-P	300-0077
APSON Paint pressure regulator key (wrench size 54 mm)	100-0105

Options: All aluminum parts of stainless steel

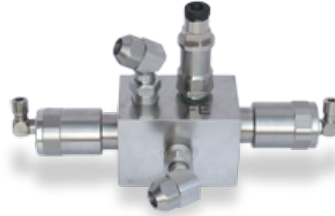
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## Part X. APSON Lacquer- System Cleaners

1.



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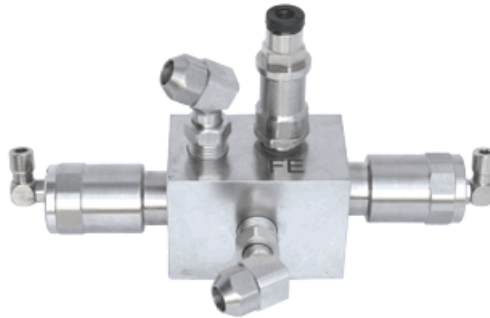
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# Pulse Cleaner CPP-2000

## 1. Introduction

The APSON Pulse Cleaner CPP-2000 is a pneumatically controllable rinsing block for aggressive lacquers and solvents. It is the standard cleanerblock designated for the modular APSON Lacquer Changer ###-2000 M.



APSON Pulse Cleaner CPP-2000

The APSON Pulse Cleaner CPP-2000 is particularly suitable for automatic painting systems with often changing lacquers and serves for rinsing the lacquer changer switch, the hoses and rotation atomizers or spray guns. It avoids reliably a pollution of the newly connected lacquer during the painting process and ensures thus a perfect lacquer change.

## 2. Features

- Small solvent consumption for perfect rinsing.
- Environmental careful short rinsing cycle due to high throughput.
- Very good rinsing barness due to deathroom-minimized valve blocks.
- The valves are compatible with the valves of the lacquer changer switch blocks.
- Fast valve exchange due to screwable valve technique.
- Pro-active maintenance possible due to leakage display of the valves.
- Visible switching status of the valves.
- Small, compact design.

## 3. Structure and Function

The APSON Pulse Cleaner CPP-2000 consists of a block housing with an output and one input each for solvent LM (LO) resp. compressed air LU. The output side of the pulse cleaner forms a pressure tight interface to the valve blocks of the lacquer change-over switch.



## APSON Pulse Cleaner CPP-2000 - Structure

A pneumatically controllable valve is assigned to each input. Due to that alternated control of the two valves, the opening times of the valves can overlap. Therefore the connection fittings of both inputs (compressed air and solvent) contain an additional checkvalve each.

During painting, solvent and compressed air pend permanently at the pulse cleaner. For executing the rinsing cycle, the solvent valve LF and the compressed air valve LLF are alternatingly opened, starting with the solvent valve.

Due to this sequence, an alternating flow of air resp. solvent develops, which rinses reliably the lacquer changer switch downstream the hoses and other spray devices. The duration of the rinsing cycle as well as the switching sequence of the two valves depend on the conditions of the painting process and are to be controlled by means of a programmable logic controller. The more briefly the switching on impulses of the two valves (preferably smaller than 1 second), the better the rinsing quality.

## 4. Technical Data

<b>Denomination:</b>	<b>APSON Pulse Cleaner CPP-2000</b>
Media:	Lacquers, solvents, caustic solutions, a.o.
Compressed air pressure:	6 to 12 bar, see also solvent pressure.
Solvent pressure:	6 to 12 bar, (1 to 1.5 bar higher than compressed air).
Valve assembly:	Two 2/2-ways valves, see Ordering Data.
Checkvalves:	Two checkvalves, see Ordering Data.
Valve switching pressure:	Min. 6 bar, max. 8 bar, measured at the valve.
Housing material:	Inoxidable steel, see Ordering Data.
Sealing material:	Viton™
Control air link:	For hose, d = 2.7 mm, D = 4 mm
Compressed air input:	For hose, d = 6 mm, D = 8 mm
Solvent input:	For hose, d = 6 mm, D = 8 mm
Dimensions, block:	Length 59 mm, Height 30 mm, Depth 42 mm
Dimensions, complete:	Length 149 mm, Height 30 mm, Depth 47 mm resp. 97 mm
Mass of the block:	approx. 280 g
Mass, complete:	approx. 380 g

## 5. Ordering Data

Denomination	Quantity	Part-Nr.
APSON Pulse Cleaner CPP-2000, complete	1	070-A005
APSON 2/2-Ways Valve 2000	2	060-A008
APSON Checkvalve 2000	2	100-A001

Options:

- 1. Housing from aluminum, anodized.
- 2. Air/solvent connectors on customer's request.

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# Turbo-Pulse Cleaner CTP-2001

## 1. Introduction

The APSON Turbo-Pulse Cleaner CTP-2001 is a pneumatically controllable rinsing block for aggressive lacquers and solvents. It is an optionally available cleaner block for the modular APSON Lacquer Changer ###-2000 M and is particularly suitable for automatic painting systems with often changing lacquers. It serves for rinsing the lacquer change-over switch, the hoses and rotation atomizers or spray guns.



APSON Turbo-Pulse Cleaner CTP-2001

This cleaner type is an advancement of the APSON Pulse Cleaner 2000 and is optimized for economical solvent consumption with constant rinsing quality. It avoids reliably a pollution of the newly connected lacquer during the painting process and ensures thus a perfect lacquer change.

## 2. Features

- Smaller solvent consumption than the APSON Pulse Cleaner CTP-2000.
- Environmental careful short rinsing cycle due to high throughput.
- Very good rinsing barness due to deathroom-minimized valve blocks.
- The valves are compatible with the valves of the lacquer change-over switch blocks.
- Fast valve exchange due to screwable valve technique.
- Pro-active maintenance possible due to leakage indication of the valves.
- Visible switching status of the valves.
- Small, compact form.

## 3. Structure and Function

The APSON Turbo-Pulse Cleaner 2001 consists of a block housing with an output and one input each for solvent LO resp. compressed air LU. The output side of the Turbo-Pulse Cleaner forms a pressure tight interface to the valve blocks of the lacquer change-over switch.



A pneumatically controllable valve is assigned to each input. To ensure a safe function of the Turbo-Pulse Cleaner the pressure at the solvent input must be approx. 1 to 1.5 bar greater than the pressure at the compressed air input. Therefore the fitting for the compressed air input is provided with an additional check valve.

During painting, solvent and compressed air pend permanently at the turbo-pulse cleaner. If a rinsing cycle is to be initiated, then with still closed compressed air valve LLF first the solvent valve LF is opened. Briefly afterwards the compressed air is released for the entire duration of the rinsing cycle. With opened compressed air valve the flow of the solvent is then periodically interrupted and released again in short time intervals. At the end of the rinsing cycle, the air flow as well as the solvent flow are stopped.

Due to this sequence, a pulsating media flow from air-sputtered solvent develops, which reliably rinses downstream the lacquer change-over switch, the hoses and other spray devices. The duration of the rinsing cycle as well as the switching frequency of the solvent valve depend on the conditions of the painting process and has to be controlled by means of a programmable logic controller. The more briefly the switching-on impulses of the solvent valve (preferably smaller than 1 second), the better the rinsing quality.

## 4. Technical Data

<b>Denomination:</b>	<b>APSON Turbo-Pulse Cleaner CTP-2001</b>
Media:	Lacquers, solvents, a.o.
Compressed air pressure:	6 to 12 bar
Solvent pressure:	6 to 12 bar, but 1 to 1.5 bar greater than compressed air pressure
Valve assembly:	two 2/2-ways valves, see Ordering Data
Checkvalve:	one checkvalve, see Ordering Data
Valve switching pressure:	6 to 8 bar, measured at the valve
Housing material:	Inoxidable steel, see Ordering Data
Sealing material:	Viton™, or after customer's request
Control air link:	for hose, d = 2.7 mm, D = 4 mm
Compressed air input:	for hose, d = 8 mm, D = 10 mm
Solvent input:	for hose, d = 6 mm, D = 8 mm
Dimensions, block:	length 85 mm, depth 39 mm, height 42 mm
Dimensions, complete:	length 99 mm, depth 39 mm, height 87 mm resp. 110 mm
Mass, block:	approx. 500 g
Mass, complete:	approx. 600 g

## 5. Ordering Data

Denomination	Quantity	Part-Nr.
APSON Turbo-Pulse Cleaner CTP-2001, complete	1	070-A002
APSON 2/2-Ways Valve 2000	2	060-A008
APSON Checkvalve 2000	1	100-A001

Options:

- Housing from aluminum, anodized.
- Sealing material after customer's request.
- Air/solvent links after customer's request.

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# Turbo Cleaner CTY-2002

## 1. Introduction

The APSON Turbo Cleaner CTY-2002 is a pneumatically controllable rinsing block for aggressive lacquers and solvents. It is an optionally available cleaner block for the modular APSON Lacquer Changer ###-2000 M and is particularly suitable for automatic painting systems with often changing lacquers. It serves for rinsing the lacquer change-over switch, the hoses and rotation atomizers or spray guns.



APSON Turbo Cleaner CTY-2002

The APSON Turbo Cleaner CTY-2002 is an advancement of the APSON Pulse Cleaner ### and APSON Turbo-Pulse Cleaner ###. It differs from the aforementioned cleaners by more flexible rinsing sequence due to non-coupled function of the valves. In all other respects the cleaners mentioned are exchangeable. The APSON Turbo Cleaner CTY-2002 is optimized for economical solvent consumption with high rinsing quality. It avoids reliably a pollution of the newly connected lacquer during the painting process and ensures thus a perfect lacquer change.

## 2. Features

- Small solvent consumption.
- Environmental careful short rinsing cycle due to high throughput.
- Very good rinsing barness due to deathroom-minimized valve blocks.
- The valves are compatible with the valves of the lacquer change-over switch blocks.
- Fast valve exchange due to screwable valve technique.
- Pro-active maintenance possible due to leakage display of the valves.
- Visible switching status of the valves.
- Small, compact form.

## 3. Structure and Function

The APSON Turbo Cleaner CTY-2002 consists of a prism formed housing with an output and one input each for solvent LO and compressed air LU. The output side of the Turbo Cleaner CTY-2002 forms a pressure tight interface to the valve blocks of the lacquer changer switch.



#### APSON Turbo Cleaner CTY-2002

A pneumatically controllable valve is assigned to each input. Due to the special formation of the eddy space and the V-shaped arrangement of the valves, a highly turbulent mixture of air and solvent develops in the lacquer change-over switch during the rinsing cycle.

Due to the special construction the APSON Turbo Cleaner CTY-2002 enables two basic application cases:

- Application with alternating control of the valves for air resp. solvent.
- Application with permanent control for air and pulsed control of the solvent.

**Case 1:** Application with alternating control of the valves for air resp. solvent. In this case both inputs are to be equipped with checkvalves, in order to prevent penetration of the different medium during possible overlap of the open-times (both valves at the same time openly) in each case.

During the painting process solvent and compressed air pend permanently at the turbo cleaner. If a rinsing cycle is to be initiated, then with still closed compressed air valve LUF first the solvent valve LOF is controlled to open. Briefly afterwards, the compressed air valve is controlled to open for the entire duration of the rinsing cycle. With opened compressed air valve the flow of the solvent is then periodically interrupted in short time intervals and released again. At the end of the rinsing cycle the air flow as well as the solvent flow are stopped.

Due to this sequence *an alternating* flow from compressed air resp. solvent develops, which rinses reliably the lacquer change-over switch downstream the hoses and other spray devices. The duration of the rinsing cycle as well as the switching sequences of the two valves depend on the conditions of the painting process and has to be controlled by means of a programmable logic controller. The more briefly the switching on impulses of the solvent valve (preferably smaller than 1 second), the better the rinsing quality.

**Case 2:** Application with permanent control for air and pulsed control of the solvent. For safe functioning of the Turbo Cleaner 2002 the pressure at the solvent input must be higher approx. 1 to 1.5 bar than the pressure at the compressed air input. Therefore only the union fitting for the compressed air input contains a checkvalve.

During the painting process solvent and compressed air pend permanently at the Turbo Cleaner 2002. If a rinsing cycle is to be initiated, then with still closed compressed air valve LUF first the solvent valve LOF is controlled to open. Briefly afterwards, the compressed air valve is controlled to open for the entire duration of the rinsing cycle. With opened compressed air valve the flow of the solvent is then interrupted in short time intervals and released again. At the end of the rinsing cycle the air flow as well as the solvent flow are stopped.

Due to this sequence a *pulsating* flow from air-sputtered solvent develops, wich rinses reliably the lacquer change-over switch downstream the hoses and other spray devices. The duration of the rinsing cycle as well as the switching frequency of the solvent valve depend on the conditions of the painting process and has to be controlled by means of a programmable logic controller. The more briefly the switching-on impulses of the solvent valve (preferably smaller than 1 second), the better the rinsing quality.

## 4. Technical Data

Denomination:	APSON Turbo Cleaner CTY-2002
---------------	------------------------------

Media:	Lacquers, solvents, a.o.
Compressed air pressure:	6 to 12 bar
Solvent pressure:	for case 1 (see above): 6 to 12 bar for case 2 (see above): 7 to 12 bar, (approx. 1 to 1.5 bar greater than compressed air)
Valve assembly:	two 2/2-ways valves, see Ordering Data
Checkvalve/s:	1 resp. 2 checkvalve/s, see above
Valve switching pressure:	6 to 8 bar, measured at the valve
Housing material:	Inoxidable steel, see Ordering Data
Sealing material:	Viton™, or after customer's request
Control air link:	for hose, d = 2.7 mm, D = 4 mm
Compressed air input:	for hose, d = 8 mm, D = 10 mm
Solvent input:	for hose, d = 6 mm, D = 8 mm
Dimensions, block:	length 70 mm, depth 42 mm, height 50 mm
Dimensions, complete:	length 70 mm, depth 42 mm, height 87 mm resp. 110 mm
Mass, block:	approx. 700 g
Mass, complete:	approx. 800 g

## 5. Ordering Data

Denomination	Quantity	Part-Nr.
APSON Turbo Cleaner CTY-2002, complete	1	070-A004
APSON 2/2-Ways Valve 2000	2	060-A008
APSON Checkvalve 2000	1 bzw. 2	100-A001

Options:

- Housing from aluminium, anodized.
- Sealing material, after customer's request.
- Air/solvent links, after customer's request.

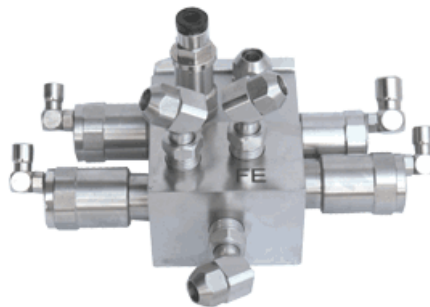
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# Secondary-Circuits Rinsinggroup CSC-2000

## 1. Introduction

The APSON Secondary-Circuits Rinsinggroup CSC-2000 serves to divide long lacquer lines into individual rinsing segments. **The resulting shorter segments can be rinsing cleaned simultanely and independently.** This leads to substantially shorter rinsing cycles and to more flexible rinsing concepts.



APSON Secondary-Circuits Rinsinggroup CSC-2000 in standard execution

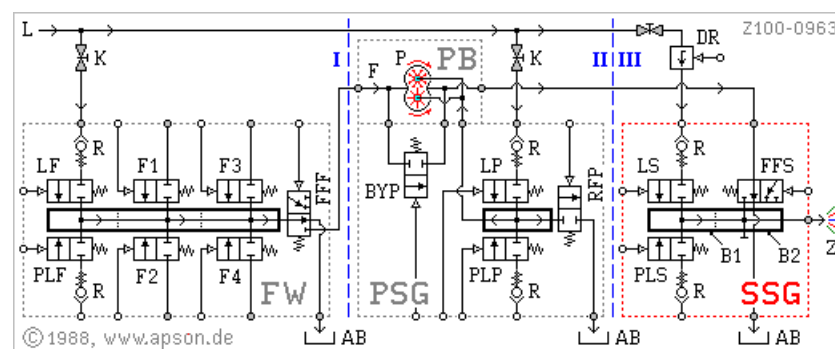
The APSON Secondary-Circuits Rinsinggroup CSC-2000 is particularly suitable to applications in automatic systems for the processing of lacquers, solvents, caustic solutions, a.o.

## 2. Features

- Cost-saving because of short rinsing duration.
- Optimal cleaning efficiency due to short rinsing segments.
- Simplest handling at assembling and maintenance.
- Fast and more easily exchange of the valves.
- Deathroom-free valves and visible switching status.
- Pro-active maintenance possible due to leakage display of the valves.
- Compact housing with high throughput.

## 3. Structure

...#####





## APSON Secondary-Circuits Rinsinggroup 2000 - Functional Scheme

**Legend**

- **Secondary-Circuits Rinsinggroup SSG (segment III):** B1 = rinsing block, B2 = switching block, LS = secondary circuit solvent, PLS = secondary circuit pulsing air, FFS = secondary circuit laquer enable.
- **Pump block PB (in segment II):** P = rinseable gearing pump, F = paint line from the laquer change-over switch.
- **Pump rinsinggroup PSG (in segment II):** LP = pump group solvent, PLP = pump group pulsing air, RFP = pump group paint feedback, BYP = pump group bypass-valve.
- **Laquer switch FW with own rinsing block (segment I):** LF = laquer switch solvent, PLF = laquer switch pulsing air, FFF = laquer switch laquer enable, Fx = laquer 1 to laquer N.
- **Other Symbols:** L = solvent line, DR = pressure regulator, AB = receptacle, RF = feedback, K = ball-valve, R = checkvalve, Z = atomizer.

**During the painting process** the feedback link of the switching block FFS is closed. The laquer flows thus through the switching block FFS to the atomizer Z.

**During the rinsing cycle** the APSON Cleaner of the lacquer change-over switch LW becomes active and the 3/2-ways valve of the switching block FFF switches the supply sided hose segment over its feedback link to the receptacle AB. The APSON Cleaner of the APSON Secondary-Circuits Rinsinggroup SSG becomes simultaneous active and rinses the mixture from lacquer, air and solvent of the atomizer-sided hoses of segment III over the feedback valve of the atomizer into the likewise receptacle AB.

## 5. Technical Data

Denomination:	APSON Secondary-Circuits Rinsinggroup CSC-2000
Media:	Lacquers, solvent, caustic solutions, a.o.
Medium pressure:	max. 12 bar
Rinsing block valves:	two APSON 2/2-Ways Valves
Switching block valves:	one APSON 3/2-Ways Valve, see Options
Housing material:	Inoxidable steel
Seal materials:	Teflon™ and/or Viton™, *
Valve control air pressure:	6 bar to 8 bar, measured at the valve
Control air pressure link:	for hose, D = 4 mm, d = 2.7 mm, *
Solvent link LM:	for hose, D = 8 mm, d = 6 mm, *
Pulsation air port PL:	for hose, D = 6 mm, d = 4 mm, *
Medium input FE:	for hose, D = 6 mm, d = 4 mm, *
Medium output:	for hose, D = 6 mm, d = 4 mm, *
Feedback port RF:	for hose, D = 8 mm, d = 6 mm, *
Dimensions without valves:	length 59 mm, width 42 mm, height 68 mm
Dimensions with valves:	length 124 mm, width 174 mm, height 88 mm
Houlder:	Support angle, *
Mass:	approx. 1.5 kg

\* or after customer's request

## 6. Ordering Data

Denomination	Part-Nr.
APSON Secondary-Circuits Rinsinggroup CSC-2000 (with one 3/2-ways valve for laquer enable/feedback)	050-A007
APSON 2/2-Ways Valve 2000 (sparepart)	060-A008
APSON 3/2-Ways Valve 2004 (sparepart)	060-A015
APSON Checkvalve 2000 (sparepart)	100-A001

Options:

- Secondary-Circuits Rinsinggroup CSC-2000 with *two* 3/2-ways valves for laquer enable/feedback.
- Secondary-Circuits Rinsinggroup CSC-2000 with APSON Turbo-Pulse Cleaner 2001.
- Secondary-Circuits Rinsinggroup CSC-2000 with APSON Turbo Cleaner 2002.

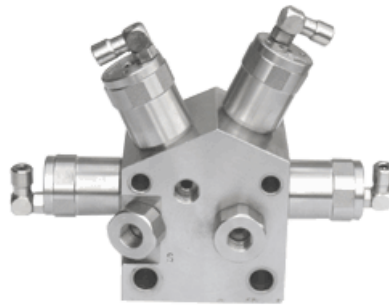
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# Pump Rinsingblock CPY-2000

## 1. Introduction

Through the attachment of the APSON Pump Rinsingblock CPY-2000 to the rinsable types of the Barmag® lacquer pumps for 6 or optionally 3 ccm/revolution, the lacquer pumps can additionally be rinsed. This enables a shorter rinsing cycle because the pump and the lacquer lines can be rinsed at the same time. Thus shorter rinsing times are achieved with better pump cleaning and more flexible rinsing concepts. The Pump Rinsingblock CPY-2000 is particularly suitable to the application in automatic systems for the processing of lacquers, solvents, caustic solutions, a.o.



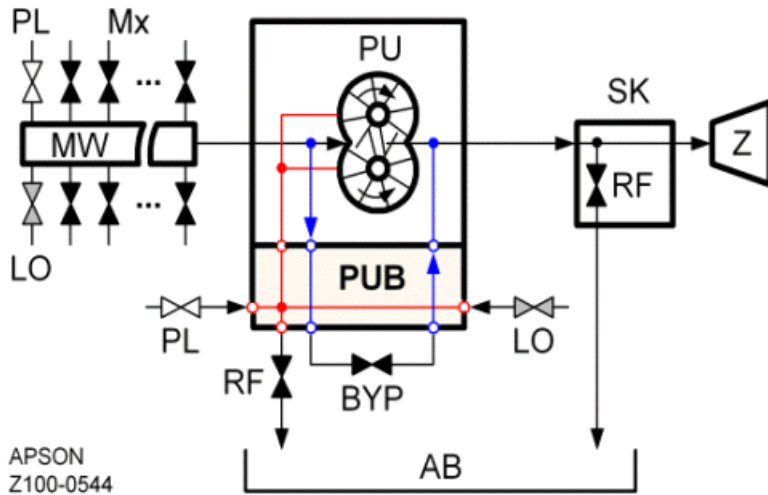
APSON Pump Rinsingblock CPY-2000

## 2. Features

- Very effective cleaning of the pump, because this is additionally rinsable.
- Cost-saving because of short rinsing times.
- Compact housing due to direct surface mounting on the pump.
- Simplest handling at assembling and maintenance.
- Faster and more easily exchange of the valves.
- Deathroom-free valves and visible switching status of the valves.
- Pro-active maintenance possible due to leakage display of the valves.

## 3. Structure and Function

All valves are controlled pneumatically. The following pattern clarifies the functional connection



APSON Pump Rinsingblock CPY-2000

**Legend:**

PUB = Pump Rinsingblock CPY-2000, MW = medium change-over switch, Z = atomizer, BYP = bypass valve, PL = pulsation air valve, RF = feedback valve, PU = pump, SK = sprayhead, AB = receptacle, Mx = medium valve x, LO = solvent valve

The APSON Pump Rinsingblock CPY-2000 consists of the following components:

- Inoxidable steel block as interface to the pump and for the accommodation of the valves and access links;
- Bypass valve. Hereby the lacquer lines can be separated and be rinsed independently of the pump during the rinsing cycle;
- A pulsation air valve and a solvent valve. These valves serve the pump for rinsing. During the rinsing cycle these two valves can be controlled alternatingly and rinse the pump with a mixture from air and solvent;
- Reconducting valve for deriving the pump rinsing mixture into the receptacle;
- Ever a checkvalve in the supply links of the pulsation air and the solvent. These prevent the penetration of solvent in the pulsation air supply or the penetration of compressed air into the solvent line during rinsing.

## 4. Technical Data

Denomination	APSON Pump Rinsingblock CPY-2000
Media	Lacquers, solvent, caustic solutions, a.o.
Medium pressure	max. 12 bar
Valve assembly	four APSON 2/2-Ways Valves 2000
Material	Inoxidable steel
Seal materials	Teflon™, Viton™-compound, or after customer's request
Valve control air pressure	min. 6 bar upto max. 8 bar, measured at the valves
Control air link	for hose, D = 4 mm, d = 2.7 mm, or after customer's request
Solvent link LM	for hose, D = 8 mm, d = 6 mm, or after customer's request
Pulsation air port PL	for hose, D = 8 mm, d = 6 mm, or after customer's request
Bypass port BY	for hose, D = 6 mm, d = 4 mm, or after customer's request
Medium output	for hose, D = 6 mm, d = 4 mm, or after customer's request

Feedback port RF	for hose, D = 8 mm, d = 6 mm, or after customer's request
Dimensions (in mm)	<ul style="list-style-type: none"> <li>• without valves: length 66, width 39, height 65</li> <li>• with valves: length 156, width 90, height 104</li> </ul>
Attachment	directly on the pump
Mass	approx. 1.5 kg

## 5. Ordering Data

Denomination	Part-Nr.
APSON Pump Rinsingblock CPY-2000, completely (for the rinsable Barmag® pump with 6 ccm/revolution)	030-A001
APSON 2/2-Ways Valve 2000 (sparepart)	060-A008
APSON Checkvalve 2000 (sparepart)	100-A001

### Options:

Adapter for attaching to the rinsable Barmag® pump for 3 ccm/revolution

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## Part XI. APSON Thermotubes

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# Thermotube TT-3008-EX for Dynamic Applications

## 1. Introduction

A regulated temperature of the spraying material - the prerequisite for optimum painting

The **APSON Thermotube-3008-EX** is a bending, flexible, temperable hose for transport of liquids and/or gases, which, for optimum application, must be heated or be cooled - used especially in Hazard Zones in the coatings industry, the chemical industry or the food industry. Wherever stationary transport systems pass over into moving systems (e.g. robots), the **APSON Thermotube TT-3008-EX** is the right solution.



APSON Thermotube TT-3008-EX as well as APSON Thermotube Interface TTI-3008

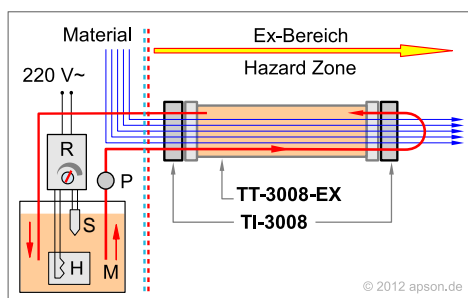
## 2. Features

- Explosion-proof properties due to passive, external temperature control.
- Robust, wear resistant, large temperature range.
- Fittings made of stainless steel or according to customer requirements.
- Environmentally friendly, low solvent losses (very good internal flushability).
- For gaseous and/or liquid (solvent or water-based) paint materials.
- Smooth outer surfaces, easy to clean, resistant to solvents.
- Usable as heating and/or cooling hose.

## 3. Structure and Function

The **APSON Thermotube TT-3008-EX** consists of a flexible, wear-resistant, solvent-resistant, temperature-resistant and form-resistant jacket hose enclosing solvent-resistant transport hoses for the liquids and/or gases which are to be transported (see the following figure). The jacket hose and transport hoses are connected at the ends by means of a pressure-tight connection fittings. The tempering of the application materials occurs by pump **P** circulating a tempering medium **M** from and to a tempering source regulated by means of a temperature regulator **R**.

The flowback of the tempering medium **M** occurs directly through the jacket hose. For optimal heat transfer as well as optimal kinematics the transport hoses in the jacket hose are laid spirally (for simplification, this is not shown in the figure).



APSON Thermotube TT-3008-EX — Functioning Scheme

**APSON Thermotube Interfaces TTI-3008** are provided with screws, and thus easy to install and dismantle. Special hose connectors ensure a reliable tightness, even after many disconnections of the parts.

## 4. Technical Data

<b>Designation:</b>	<b>APSON Thermotube TT-3008-EX *</b>
Working materials:	Lacquers, hardeners, alkalis, solvents, gases, a.o.
Tempering medium:	Water, glycol mixture, a.o.
Operating pressure of working materials:	Max. 10 bar
Operating pressure of tempering medium:	Max. 4 bar
Minimal bending radius:	Min. 30 cm
Temperature range of tempering medium:	0 – 120 °C
Casing materials:	Plastics, Teflon™, stainless steel, light metal
Seals:	Viton™
Connectors for working materials (5):	For hoses, 3 times (6x8) mm and 2 times (4x6) mm
Connectors for tempering medium (2):	For hoses, 2 times (6x8) mm (flow and flowback)
Interface diameter:	Approx. Ø 100 mm, robot interface

\* Almost all technical data are also available according to customer's request.

## 5. Ordering Data

Designation	Ordering-Number
APSON Thermotube TT-3008-EX ( 3500 mm = 2500 mm + 2 x 500 mm) *	010A057
APSON Thermotube TT-3008-EX ( 2400 mm = 1400 mm + 2 x 500 mm) *	010A058
APSON Thermotube TT-3008-EX ( 2900 mm = 1900 mm + 2 x 500 mm) *	010A059
APSON Thermotube TT-3008-EX (11000 mm = 10000 mm + 2 x 500 mm) *	010A060
APSON Thermotube TT-3008-EX ( 2220 mm = 1220 mm + 2 x 500 mm) *	010A061
APSON Thermotube TT-3008-EX (please specify the required lengths) *	#####

\* The two **Interfaces TTI-3008** belonging to the respective thermotube are additionally equipped with Teflon™ single-hoses. The lengths of these hoses default to 500 mm.

**Options:** Other hose lengths are available according to customer specifications.

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## Part XII. APSON Spray Bells

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# Spray Bells

## 1. Introduction

APSON spray bells are high-speed rotators for yielding and fine dissipation of liquid media. Typical media are normal lacquers, metallic lacquers or other aggressive liquids, e.g. solvents.



APSON Spray Bells

## 2. Structure

APSON spray bells are rotationally symmetrically developed. They usually consist of at least two parts - the front part and the coat.

The **front part** usually consists of polished inoxidable steel, aluminum, titanium or plastic. It has also the task to connect the spray bell anti-swiveling with the shaft as well as to lead the medium in a thin layer to the edge of the spraying bell during the application. The edge of the spraying bell can be executed knurled or smoothly. There are spraying bells for turbines with hollow or full waves.

The **coat** consists usually of lighter material, e.g. aluminum or plastic. It has the task to determine the flow conditions of air in direct proximity of the spraying bell.

## 3. Function

During the application at the spray bell a high electrical DC voltage from -40 to -80 kilovolts is applied. The objects which are to be sprayed are on earth potential (0 V).

At rated speed from 40000 to 60000 revolutions per minute the electrically charged medium yields through the center of the front surface.

Because of strong centrifugal forces the medium flows over the edge of the front surface into the strongly whirling ambient air. Due to the detachment of the edge of bell a fine fog from negatively charged spraying medium forms.

If the medium was sufficient strongly loaded, the droplets shatter in the air into still smaller droplets. These are attracted by the object to be sprayed due to the dominant electrical field. In this way the fine spray deposits even on those object surfaces that are turned away from the bell.

## 4. Ordering

APSON has experience of many years in the production and repair from spray bells for electrostatic painting.

**New spray bells** can be manufactured also according to specification of the customer. Condition is a Written Explanation of the customer that he has copyrights or manufacturing rights of the respective spray bell or bell type.

Alternatively APSON develops and produces inexpensive and high-quality spare bells for already existing Plants. These obtain the same painting quality as the original bells. From arguments of rights they must have however different geometrical dimensions than the originally employed bells.

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## Part XIII. APSON Hose Connectors

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# APSON Hose Connectors - Overview

APSON primarily offers the following types of hose connectors.

- Swivel Connectors and Swivel Adapters.
- Straight Connectors, Straight Adapters and Shutter Connectors.

All connectors have a high throughput, and are well rinseable. They are suitable for liquid aggressive media, e.g. lacquers, solvents, alkalis. The sealing surface to the block side is 90° conical, or 170° "flat." The connection to the hose side is smooth or bulged.

## Selection Guide

The **Swivel Connectors** are angled (perpendicular or obtuse), or arced. Arced Swivel Connectors behave more linear over the entire range of flow rates.

The **Straight Connectors** and Shutter Connectors are available with the following block-side threads: M5, G1/8" G1/4", G3/8", G1/2".

**Special fittings** according to customers specification are available on request.

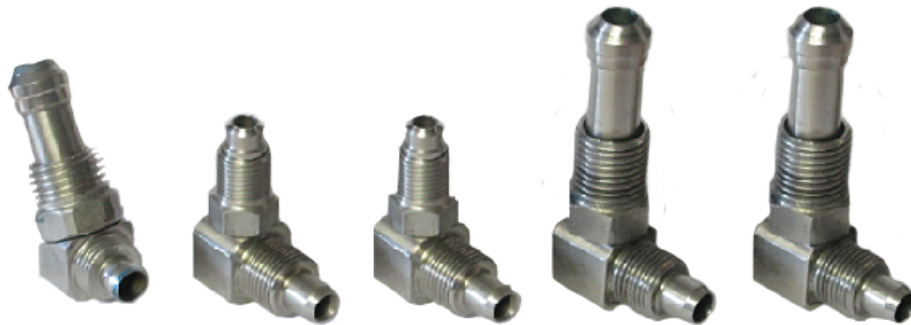
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# Hose Swivel Connectors

2014.05.22, Revision 1

## 1. Introduction

**APSON Hose-Swivel-Connectors** are mainly used in the coatings industry. They connect normal paint and solvent hoses with standard valve blocks and paint changers *or* with other connectors with compatible dimensions.



APSON Hose-Swivel-Connectors (a selection without hose-nuts)

## 2. Features

- Robust construction, large throughput and good flushability.
- Compatible with all block types according to the drawings of the following sections.
- Quasi-linear throughput rates at pressure changes (for curved connectors).
- Compact dimensions (for angled connectors).

## 3. Structure and Function

**APSON Hose-Swivel-Connectors** are usually made of stainless steel and are brazed or welded, depending on the type. Basically, they are available in two versions: **angled** or **bent**. Due to their construction they allow connections with different connection blocks, tube diameters, deflection angles and swivel directions. The desired swivel direction can be adjusted by tightening the nut. For each connector the to be ordered hose nut is dependent on the outer diameter of the hose provided.

### Caution

Hoses and fittings as installed, can still hold residual pressure and / or medium (paint, solvent, alkali, o.a.) even after system shutdown. Before handling these parts, make sure they are completely emptied, rinsed and with absolutely no pressure. The relevant safety regulations (fire protection, explosion protection, wearing of appropriate goggles, masks, gloves, protective clothing, etc.) must be followed.

In the following, the hose swivel connectors are mainly classified according to:

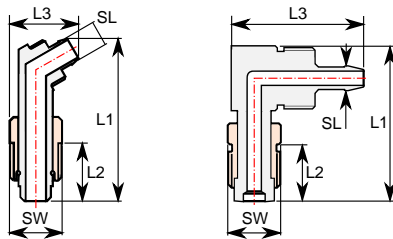
- **Type of the deflection angle** : angled or curved.

- **Size of the deflection angle** : 90° right angle, 120° obtuse, or other angle.
- **Type of the thread** : Inches or metric.
- **Type of sealing surface** : 90° conical or 170° resp. 180° "flat".

Main advantage of the **angled** connectors is their **compact type**.

Main advantage of the **bent** connectors is their **quasi-linear behavior** of the throughput rates at pressure changes.

Hose swivel connectors for tubes with small diameters usually have smooth connection ports. Some hose swivel connectors for tubes with larger diameters have bulged ports for secure attachment. At the customer request there are also available connectors with different dimensions according to customer specifications.



APSON Hose Swivel Connectors - General dimensions

**Legend:** SW = nut wrench size, G = nut thread, L.. = length ..

## 4. Ordering Data

### Annotations:

- The desired hose nut (last column) is additionally to be ordered, because it is not always clear (some nuts can fit on various connectors, depending on the outer diameter of the tube).
- Standard material is stainless steel 1.4305. Parts of other materials or other technical data are available according to customer specification.

## 5. G1/8" Rectangular

Ord.-Nr. (1 of 2)	Thread G	Sealing Surface	Deflec- tion Angle	SW [mm]	Hose Ø [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	Hose Nut, Ord.Nr. (2 of 2)
100-0933	G1/8"	90°, conical	90°, rectangular	11	6x8	35	13	27	100-0118
100-0557	G1/8"	90°, conical	90°, rectangular	11	6x8	35	13	22	100-0558
100-0557	G1/8"	90°, conical	90°, rectangular	11	6x9	35	13	22	100-0559
100-0665	G1/8"	90°, conical	90°, rectangular	11	9x12	63	13	22	100-0597
100-0666	G1/8"	90°, conical	90°, rectangular	11	6x12	63	13	22	100-0597



Ord.-Nr. (1 of 2)	Thread G	Sealing Surface	Deflec- tion Angle	SW [mm]	Hose Ø [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	Hose Nut, Ord.Nr. (2 of 2)
<b>100-1429</b>	G1/8"	90°, conical	90°, rectangular	11	4x6	35	13.5	23	<b>100-1430</b>

## 6. G1/4" Rectangular

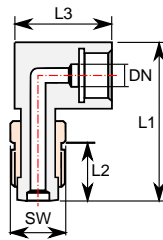
Ord.-Nr. (1 of 2)	Thread G	Sealing Surface	Deflec- tion Angle	SW [mm]	Hose Ø [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	Hose Nut, Ord.Nr. (2 of 2)
<b>100-0560</b>	G1/4"	90°, conical	90°, rectangular	14	6x8	60	13	22	<b>100-0558</b>
<b>100-0560</b>	G1/4"	90°, conical	90°, rectangular	14	6x9	60	13	22	<b>100-0559</b>
<b>100-0169</b>	G1/4"	90°, conical	90°, rectangular	14	8x12	45	13	25	<b>100-0170</b>
<b>100-0698</b>	G1/4"	90°, conical	90°, rectangular	14	6x12	63	13	22	<b>100-0200</b>
<b>100-0693</b>	G1/4"	90°, conical	90°, rectangular	14	9x12	63	13	22	<b>100-0200</b>
<b>100-0947</b>	G1/4"	90°, conical	90°, rectangular	14	6x8	45	13	25	<b>100-0118</b>
<b>100-0949</b>	G1/4"	90°, conical	90°, rectangular	14	8x10	45	13	25	<b>100-0150</b>
<b>100-1319</b>	G1/4"	170°, "flat"	90°, rectangular	14	DN6	41	15	35	<b>100-1314</b>
<b>100-1320</b>	G1/4"	170°, "flat"	90°, rectangular	14	DN4	41	15	35	<b>100-1317</b>

## 7. G1/4" Obtuse

Ord.-Nr. (1 of 2)	Thread G	Sealing Surface	Deflec- tion Angle	SW [mm]	Hose Ø [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	Hose Nut, Ord.Nr. (2 of 2)
<b>100-0219</b>	G1/4"	90°, conical	120°, obtuse	14	4x6	45	13	20.5	<b>100-0220</b>
<b>100-0197</b>	G1/4"	90°, conical	120°, obtuse	14	6x8	45	13	20.5	<b>100-0118</b>
<b>100-0197</b>	G1/4"	90°, conical	120°, obtuse	14	6x9	45	13	20	<b>100-0198</b>
<b>100-0585</b>	G1/4"	90°, conical	120°, obtuse	14	6x8	45	15	20	<b>100-0118</b>
<b>100-0585</b>	G1/4"	90°, conical	120°, obtuse	14	6x9	45	15	20	<b>100-0198</b>
<b>100-0199</b>	G1/4"	90°, conical	120°, obtuse	14	9x12	49	16	20	<b>100-0200</b>

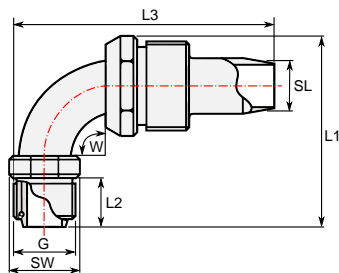
Ord.-Nr. (1 of 2)	Thread G	Sealing Surface	Deflec- tion Angle	SW [mm]	Hose Ø [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	Hose Nut, Ord.Nr. (2 of 2)
100-0599	G1/4"	90°, conical	120°, obtuse	14	9x12	46	16	17	100-0200
100-0948	G1/4"	90°, conical	120°, obtuse	14	8x10	45	16	20	100-0150

## 8. Swivel Adaptors 90°



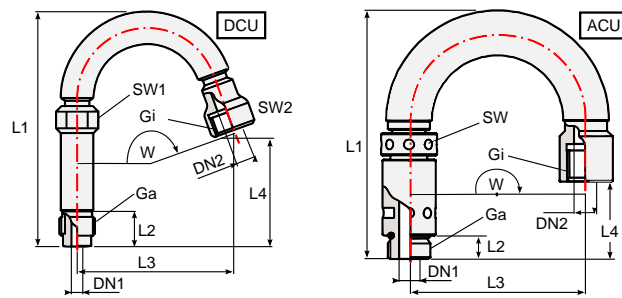
Ord.-Nr. (1 of 2)	Thread Gi	Thread Ga	Sealing Surface	Deflec- tion Angle	SW [mm]	DN	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)
100-1321	G1/4"	G1/4"	170°, "flat"	90°, rec- tangular	14	DN4	41	15	25
100-1322	G1/4"	G1/4"	170°, "flat"	90°, rec- tangular	14	DN6	41	15	25

## 9. Arced Connectors



Ord.-Nr. (1 of 2)	Thread G	Sealing Surface	Deflec- tion Angle	SW1/ SW2 [mm]	Hose Ø [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	Hose Nut, Ord.Nr. (2 of 2)
100-1327	G3/8"	170°, "flat"	90°, Arc	19/27	12x18.5	51	15	67	100-1315
100-1327	G3/8"	170°, "flat"	90°, Arc	19/27	12x20	51	15	67	100-1337
100-1327	G3/8"	170°, "flat"	90°, Arc	19/27	12x20.5	51	15	67	100-1456

## 10. Arced Adaptors



Ord.-Nr.	Thread Gi	Thread Ga	Deflec- tion Angle	SW1/ SW2 [mm]	DN1 / DN2	L1 [mm] (approx.)	L2 [mm] (approx.)	L3 [mm] (approx.)	L4 [mm] (approx.)
<b>100-1409</b> *	G1/4" x 180°	G1/4" x 170°	160°, Arc	14/17	DN6 / DN6	86	13	58	40
<b>100-1348</b> #	G3/8" x 180°	G3/8" x 170°	180°, Arc	Special §	DN10 / DN13	100	9.5	70	30

\*DCU, #ACU, § APSON Special Key, Ordering Nr. Z100-1506

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# Hose-Straight-Connectors

2014.05.20

## 1. Introduction

**APSON Hose-Straight-Connectors and APSON Hose-Adaptors** are mainly used in the coatings industry. They connect normal paint and solvent hoses with standard valve blocks and paint changers and with other connectors with compatible dimensions.



APSON Hose-Straight-Connectors and APSON Hose-Adaptors (a selection, without hose-nuts)

## 2. Features

- Compatible with all block types according to the drawings of the following sections.
- Robust construction, large throughput and good flushability.

## 3. Structure and Function

**APSON Hose-Straight-Connectors and APSON Hose-Adaptors** are usually made of stainless steel or PETB. Due to their construction they allow connections with different connection blocks, tube diameters, and other connectors. For each connector the to be ordered hose nut is dependent on the outer diameter of the hose provided.

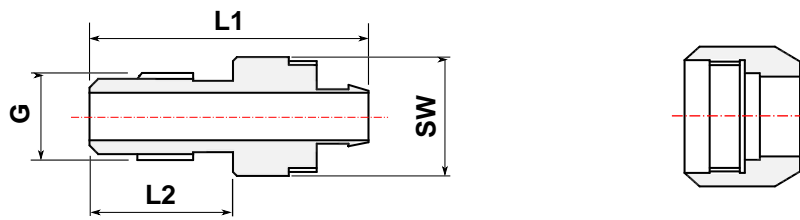
### Caution

Hoses and fittings as installed, can still hold residual pressure and / or medium (paint, solvent, alkali, o.a.) even after system shutdown. Before handling these parts, make sure they are completely emptied, rinsed and with absolutely no pressure. The relevant safety regulations (fire protection, explosion protection, wearing of appropriate goggles, masks, gloves, protective clothing, etc.) must be followed.

In the following, the hose connectors are mainly classified according to:

- **Type of the thread:** inches or metric.
- **Type of sealing surface:** 90° conical, or 170° resp. 180° "flat" (see figure in section 13).

Hose connectors for tubes with small diameters usually have smooth connection ports. Some hose connectors for tubes with larger diameters have bulged ports for secure attachment. Other hose connectors are hose adaptors, hose Schott connectors, or other. There are also available connectors with other dimensions according to customer specifications.



APSON Hose-Straight-Connectors and Hose Nuts - General dimensions

**Legend:** G = Thread, SW = Wrench size, L = Length

## 4. Ordering Data

### Annotations:

- The desired hose nut (last column) is additionally to be ordered, because it is not always clear (some nuts can fit on various connectors, depending on the outer diameter of the tube).
- Standard material is stainless steel 1.4305. Standard material is stainless steel 1.4305. Parts of other materials or other technical data are available according to customer specification.

## 5. M5 x 90°

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
100-1008	14	6x8	27	16	100-0118
100-1008	14	6x9	27	16	100-0198

## 6. M5 x 170°

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
100-1009	11	4x6	27	16	100-0505

## 7. G1/8" x 90°

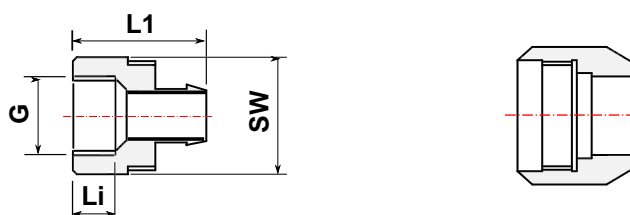
Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
100-0687	11	3x5	37	12.5	100-0688
100-0125	14	4x6	32	12.5	100-0128
100-0504	11	4x6	37	13	100-0505
100-0582	14	6x8	35	13	100-0118
100-0582	14	6x9	35	13	100-0198
100-0667	14	6x12	30	16	100-0200
100-0595	14	9x12	35	16	100-0597
100-1078	22	6x8	40	13	100-0118
100-1078	22	6x9	40	13	100-0198

## 8. G1/4" x 90°

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
100-0628	14	3x5	35	18	100-0629
100-0228	14	4x6	35	18	100-0220
100-0230	14	4x6	27	13	100-0220
100-0327 #	15	4x6	50	18	100-0328
100-0329 #	15	6x8	50	18	100-0330
100-0202	14	6x8	27	18	100-0118
100-0229	14	6x8	35	18	100-0118
100-0229	14	6x9	35	18	100-0198
100-0202	14	6x9	27	18	100-0198
100-0149	14	8x10	32	18	100-0150
100-0596	14	9x12	35	16	100-0200
100-1131	19	11x14	40	20	100-1132
100-0669	22	14x18	40	18	100-0670
100-1324	17	DN4	43	13	100-1317
100-1313	17	DN6	43	13	100-1314
100-1333	14	6x8	35	13	100-1334
100-1333	14	6x9	35	13	100-0198
100-1335	14	8x10	35	13	100-1336

# = PETB

## 9. G1/4i x 90°, inner Thread



APSON Hose-Straight-Connectors G1/4" with inner Thread x 90° conical Sealing - Dimensions

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose [mm]	L1 [mm] (approx.)	Li [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
100-0919	14	6x8	20	7.5	100-0118
100-0919	14	6x9	20	7.5	100-0198

## 10. G1/4" x 170°

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
100-1324/5	17	DN4	41	12	100-1317
100-1313/5	17	DN6	45	14	100-1314

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
<b>100-1415/5</b>	14	4x6	33	13	<b>100-1342</b>
<b>100-1416/5</b>	14	4x6	33	9	<b>100-1342</b>
<b>100-0230/1</b>	14	4x6	27	13	<b>100-0220</b>
<b>100-1333/5</b>	14	6x8	35	13	<b>100-1334</b>
<b>100-1333/5</b>	14	6x9	35	13	<b>100-0198</b>
<b>100-1335/5</b>	14	8x10	35	13	<b>100-1336</b>

## 11. G3/8" x 90°

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
<b>100-1414</b>	22	6x8	40	17.5	<b>100-1334</b>
<b>100-1414</b>	22	6x9	40	17.5	<b>100-0198</b>
<b>100-1310</b>	27	12x18.5	60	17	<b>100-1315</b>
<b>100-1310</b>	27	12x20	60	17	<b>100-1337</b>
<b>100-1310</b>	27	12x20.5	60	17	<b>100-1456</b>
<b>100-1310/1</b>	27	12x18.5	60	17	<b>100-1315</b>
<b>100-1310/1</b>	27	12x20	60	17	<b>100-1337</b>
<b>100-1310/1</b>	27	12x20.5	60	17	<b>100-1456</b>

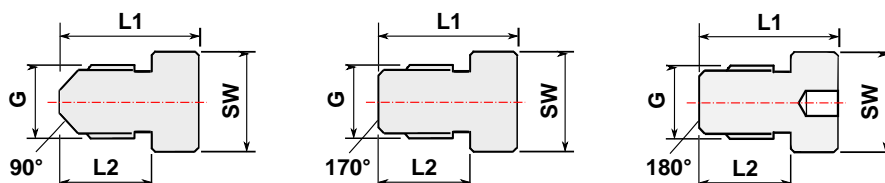
../1 = hose port with bulge

## 12. G1/2" x 90°

Ord.-Nr. (1 of 2)	SW [mm]	Ø Hose [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Hose Nut Ord.- Nr. (2 of 2)
<b>100-1311</b>	27	12x18,5	65	19	<b>100-1315</b>
<b>100-1311</b>	27	12x20	65	19	<b>100-1337</b>
<b>100-1311</b>	27	12x20,5	65	19	<b>100-1456</b>
<b>100-1311/1</b>	27	12x18,5	65	19	<b>100-1315</b>
<b>100-1311/1</b>	27	12x20	65	19	<b>100-1337</b>
<b>100-1311/1</b>	27	12x20,5	65	19	<b>100-1456</b>

../1 = hose port with bulge

## 13. Cap Screws



APSON Cap Screws with 90° conical and 170° resp. 180° flat Sealing - Dimensions

Optionally Cap Screws can be delivered for Inbus keys.



Cap Screws 90°, conical

Ord.-Nr.	Thread	SW [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Note
100-0509	G1/8"	11	16.5	13	-
100-0181	G1/4"	14	17.5	12.5	-

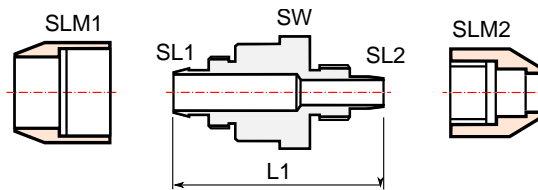
Cap Screws 170°, "flat"

Ord.-Nr.	Thread	SW [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Note
100-0509/5	G1/8"	11	16.5	13	-
100-0181/5	G1/4"	14	16.5	11.5	-

Cap Screws 180°, flat

Ord.-Nr.	Thread	SW [mm]	L1 [mm] (approx.)	L2 [mm] (approx.)	Note
200-0573	RP1/4"	14	16.5	11.5	long
200-0574	RP1/8"	5, inner	11.5	8	long
200-0496	RP3/8"	8, inner	12	7.5	long

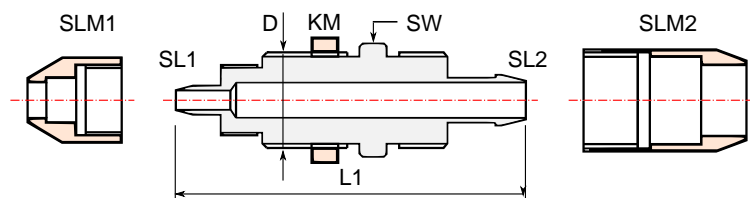
## 14. Double Connectors



APSON Hose Double Connectors - Dimensions

Ord.-Nr. (1 of 2)	SW	Ø Hose1 / Ø Hose2	L1 [mm] (approx.)	Hose Nut Ord.-Nr. (2 of 2)
100-1035	25	9x12 / 6x8	47.5	100-0597 / 100-1334
100-1063	27	12x16 / 12x16	47	100-1064 (2x)

## 15. Schott Connectors



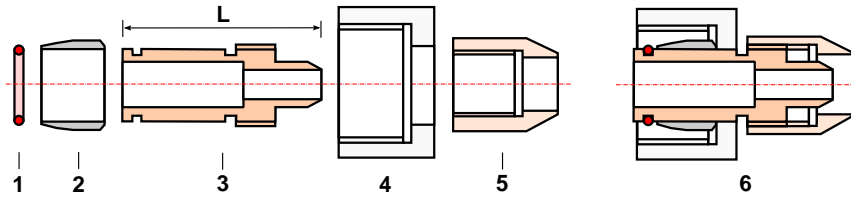
APSON Schott Connectors - Dimensions

Ord.-Nr. (1 of 3)	SW	Ø Hose1 / Ø Hose2	L1 [mm] (approx.)	D [mm]	SLM1 / SLM2 Ord.-Nr. (2 of 3)	KM Counter Nut Ord.-Nr. (3 of 3)
100-1341	19	4x6 / DN6	58	M16x1.5	100-1342 / 100-1314	100-1380

Ord.-Nr. (1 of 3)	SW	Ø Hose1 / Ø Hose2	L1 [mm] (approx.)	D [mm]	SLM1 / SLM2 Ord.- Nr. (2 of 3)	KM Counter Nut Ord.- Nr. (3 of 3)
<b>100-1395</b>	22	DN6 / DN6	60	M18x1	<b>100-1314 (2x)</b>	<b>200-0540</b>

## 16. Cutting Ring Adaptors

This type of adapter each consists of O-ring (1), adapter sleeve (3) and hose nut (5). The cutting ring (2) and nut (4) are parts of commercial cutting ring fittings. Prior to assembly (6) the O-ring is to be removed, and after assembly it is to be put back.



APSON Hose Adaptors for Cutting Ring Connectors - Explosion- and Assembly-Drawing

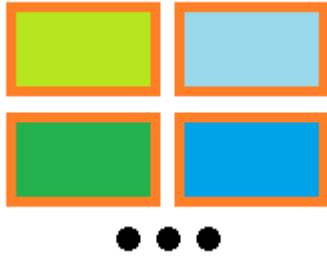
Ord.-Num- mer (1 of 2)	Cutting Ring Connector	Ø Hose	L [mm] (approx.)	Hose Nut Ord.- Nummer (2 of 2)
<b>100-1313/7</b>	12L	DN6	40	<b>100-1314</b>
<b>100-1414/71</b>	12L	6x8	33	<b>100-1334</b>
<b>100-1414/71</b>	12L	6x9	33	<b>100-0198</b>

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## Part XIV. APSON - Other Products

1.



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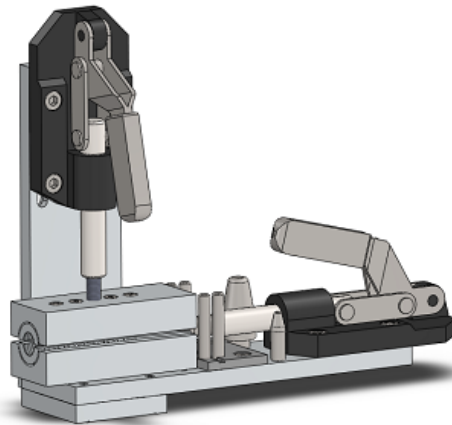
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# Hosemountingtool HMT-1012

## 1. Introduction

The **APSON Hosemountingtool HMT-1012** is a multi-purpose tool for *cutting and widening of fabric-reinforced high pressure hoses*. The tool is equipped with *multiple expansion plugs* with different head diameters and *two pairs of adapting shells* for different hose diameters.

This tool is used for applications where *on-site assembly* is required and if difficult to handle *stiff tubings* have to be exactly cut to length and are *only laboriously expandable*.



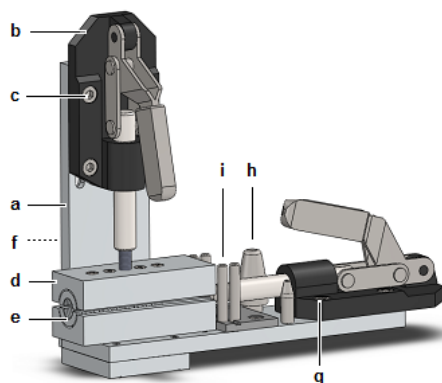
APSON Hosemountingtool HMT-1012

## 2. Features

- Quick adjustable *fixing device* with different hose adapting shells.
- Quick adjustable *expander device* with mandrels with different sizes.
- Quick hose fixing and optimum tube cutting surface.
- Easy to use, no special tools needed.
- Light weight, ideal for mobile use.

## 3. Structure und Function

The **APSON Hosemountingtool HMT-1012** consists of a rigid frame at which two clamping devices are arranged perpendicular to each other. The vertical device is used for fixing the hose and is screw-adjustably connected to the frame and therefore adaptable to the hose diameter.



APSON Hosemountingtool HMT-1012

**Legend:** a = tool frame, b = fixing device, c = adjustment screws, d = fixing jaws, e = hose adapter shells, f = alternative hose adapter shells (rear mounted, and therefore not visible in the picture), g = expander device, h = mandrels, i = cutting guides.

**Attention:** Due to their design the mechanisms of the clamping devices can exert large forces in their final positions. To avoid bruising, gloves should be worn and the levers of the clamping devices should only be operated in the area of their handles, and be operated only slow!

**Use:** 1. Screw on the *correct mandrel* to the tappet of the expander device. 2. Before clamping a hose, choose the *correct pair of adapter shells* and install them to the inner surface of the fixing jaws. 3. Loosen the *four* screws at the rear of the frame of the vertical fixing device *so that it can be moved*. 4. Open the operating lever of the horizontal expander device. 5. With opened operating lever of the fixing device, push the hose between the adapter shells until reaching the expander mandrel. 6. Move the opened(!) fixing device as far as possible down and tighten the screws (so that the hose can be properly clamped when closing the fixing device). 7. Close carefully the lever of the fixing device. 8. Cut the hose (between the cutting guides). 9. Open the fixing device and remove the cut hose portion (remainder). 10. With opened fixing device, push the hose again between the hose adapter shells near to the expansion mandrel (about 5 mm in front of it, *or as needed*) of the expander device and close carefully the fixing device. 11. Carefully and slowly operate several times the lever of the expander device back and forth, until the hose is expanded.

## 4. Technical Data

Designation:	APSON Hosemountingtool HMT-1012
Sizes of hose adapter shells:	DN4, DN6, DN12 mm *
Sizes of the expander mandrels:	DN4, DN6, DN12 mm *
Dimensions, L x W x H:	Approx. 210 x 46 x 176 mm
Mass:	Approx. 1.5 kg

\* Or according to customer specifications.

## 5. Ordering Data

Designation	Ordering number
APSON Hosemountingtool HMT-1012	100A1419

Options: According to customer specifications.

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# Glass Siphon GSI-1019

## 1. Introduction

The **APSON Glass Siphon GSI-1019** is a simple visual inspection device for (almost) non-pressure sections of media supply systems (e.g. transparent liquid release agent). It is resistant to acids, alkalis and solvents.

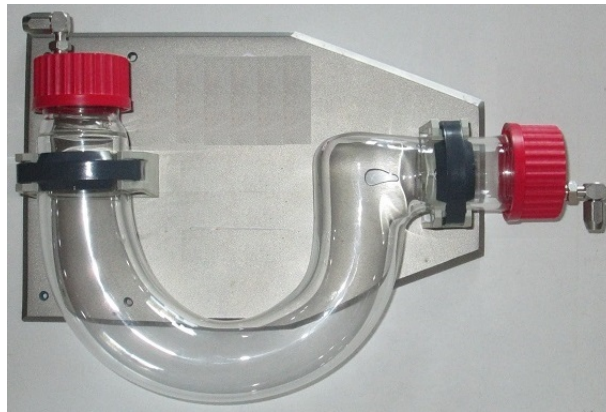


Fig. 1: APSON Glass Siphon GSI-1019

## 2. Features

- Visual inspection device resp. sight glass for wall mounting.
- Easily installed and removed, using pipe clamps.
- Good visual inspection due to highly transparent glass.
- Easy to use, requires no special tools.

## 3. Structure and Function

The **APSON Glass Siphon GSI-1019** consists of a U-shaped glass body having a vertical and horizontal connector. The respective ends of the siphon are closed with overthrow nuts, stainless steel lids with connecting threads and O-rings. The siphon is to be attached by means of two pipe clamps to mount walls in the field of view of the observer.

**Warning:** When working on or near a glass siphon, protective equipment (goggles, gloves, etc.) must be worn! Any mechanical disproportionate use of force against a glass siphon is to be avoided!

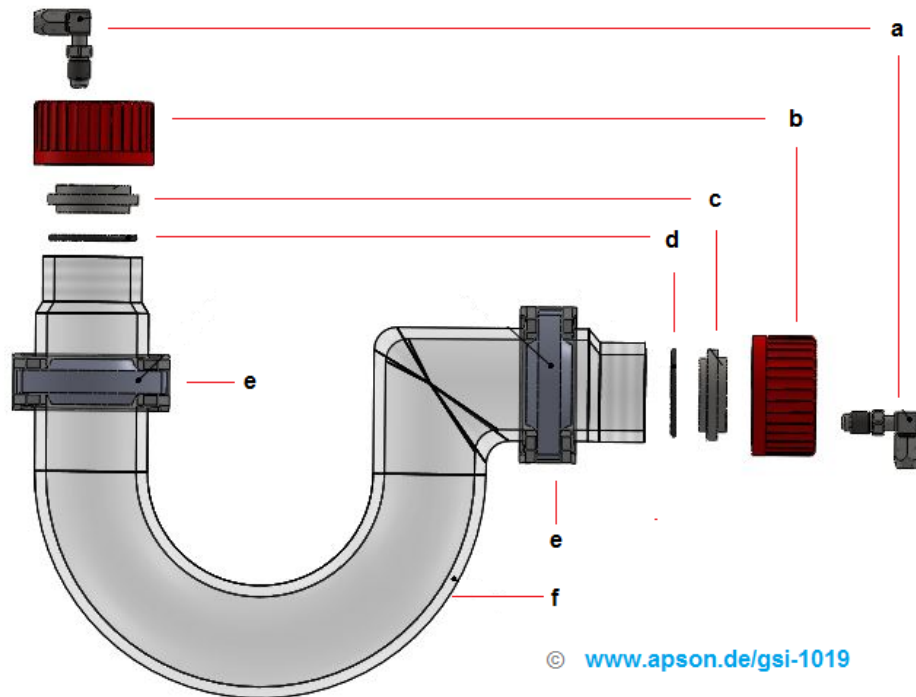


Fig. 2: APSON Glass Siphon GSI-1019 - Structure

Legend: a = hose fittings, b = overthrow nuts, c = threaded lid for hose connector, d = O-rings, e = pipe clamps, f = glass siphon.

## 4. Technical Data

Denomination:	APSON Glass Siphon GSI-1019
Maximal pressure range:	-0.2 bar to +0.1 bar
Materials:	Glass bulb: Borosilicat; Overthrow nuts: Polybutylenterephthalat (PBT); Siphon lids: Stainless steel 1.4305
O-Rings:	Viton™ *
Connectors:	APSON hose connectors, 2 pieces, G1/4" *
Dimensions, L x H [mm]:	Approx. 315 x 250, Siphon diameter: 50 mm
Mass:	Approx. 750 g (without pipe clamps)

\* Or according to customer specification.

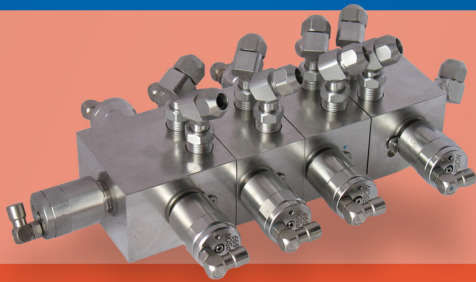
## 5. Ordering Data

Denomination	Ordering Nr.
APSON Glass Siphon GSI-1019	020A005

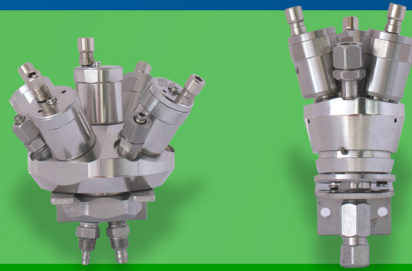
Options: According to customer specification.

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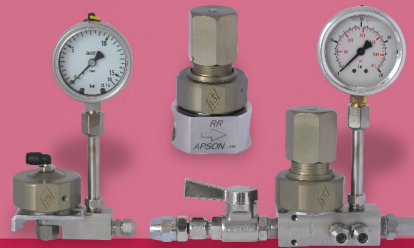
**Lacquer Changers**



**2C Switching Blocks**



**Lacquer Valves**



**Lacquer Pressure Components**



**Lacquer-System Cleaners**



**Thermotubes**



**Hose Connectors**

...

**Others**

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