

# Resato

## HIGH PRESSURE TECHNOLOGY



### HIGH PRESSURE VALVES

Hand-operated / Air-actuated

Maximum working pressure 14,000 bar / 200,000 psi.

Large orifices at rated pressures.

Excellent flow capacity performance.

Safety guaranteed by special safety cover.

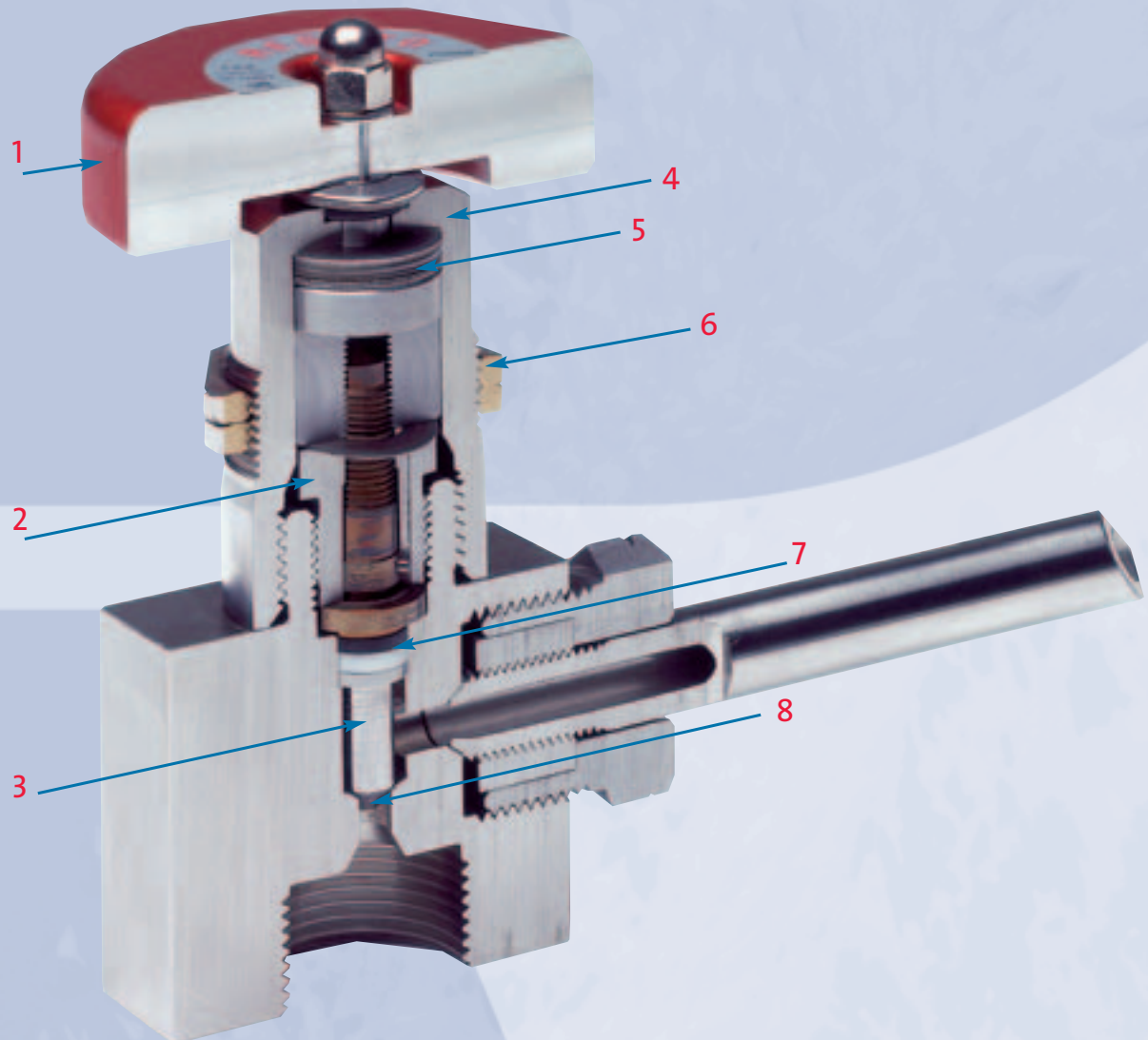
Smooth operation under pressure due to internal needle thrust bearing.

Panel mounting standard.

Air actuators available for all hand-operated valves.

## CONTENTS

- 3 Complete range of valves
- 3 Valve features
- 4 Valve materials
- 4 Ordering code system
- 4 Ordering a Resato hand-operated valve
- 5 Hand-operated high-pressure valve (connections M16x1.5 and 9/16"-18 UNF)
- 6 Hand-operated high-pressure valve (connections M20x1.5 and 3/4"-16 UNF)
- 7 Hand-operated high-pressure valve (connections M30x2 and 1 1/8"-12 UNF)
- 9 Air-actuated valves
- 10 Body types air-actuated valves type V
- 11 Ordering information
- 12 Dimensions air-actuated valves
- 13 Air-actuated valves, type VJ1 (with integrated air actuator)
- 13 Ordering code table
- 14 Dimensions



## COMPLETE RANGE OF VALVES

Resato offers a complete range of valves for high-pressure applications.

Special attention has been paid to the safety of the valves. Customers all over the world have extensively tested the reliability of our products. Resato valves are used in applications ranging from water-jet cutting systems, high-pressure test systems, high-pressure food preservation systems to test and control systems used in the oil/gas and chemical/petrochemical industries.

Our catalog lists standard valves (hand-operated and air-operated); however, we also supply customized valve designs for specialized applications.

## VALVE FEATURES

- Safety cover protects the operator against blowout of valve internals (4).
- Internal stem-lifting stop prevents stem blowout (2).
- Ergonomically formed hand wheel prevents damage to hand-operated valves by use of "strange tools" (1).
- Needle thrust bearing ensures smooth operation (5).
- Non-rotating stem made of hardened stainless steel (3).
- Self-adjusting compensating packing requires minimal pre-loading (7).
- Low frictional resistance and excellent chemical resistance of packing material.
- Wide internal orifices ensure excellent flow capabilities (8).
- Suitable for panel mounting, standard panel nuts are supplied (6).
- All Resato valves are designed for a long service life.

## VALVE MATERIALS

**Body** Up to 4200 bar (60,000 psi) valve bodies are made of cold drawn stainless steel, type DIN 1.4404 (316L); for higher pressures, valve bodies are made of specially treated stainless steel, type 15-5PH.

**Stem** Made of specially treated stainless steel, type 17-4PH, for all pressure ratings.

**Packing** Teflon and polyethylene based materials.

**Protection cap** Stainless steel DIN 1.4401/1.4404 (316/316L).

**Hand wheel** Aluminium, colour anodized

All valves are marked with Resato logo, ordering code, material specification, pressure rating and material batch number (refers to DIN 3.1.B material certificate).

### Nace MR-01-75

On request most valves are available to NACE MR-01-75 for sour gas service. In this case a "SG" will be added to the ordering code.

## ORDERING CODE SYSTEM

### Valve connections

(for hand-operated and air-operated valves)

The first number after the V-code of the valve indicates the high-pressure connection type. A "U" is added for UNF-connections.

**Code** connection

**V1** M16 x 1.5 (for 6 mm and 1/4" O.D. tubing)  
**VU1** 9/16" – 18 UNF (for 6 mm and 1/4" O.D. tubing)

**V2** M20 x 1.5 (for 10 mm and 3/8" O.D. tubing)  
**VU2** 3/4" – 16 UNF (for 10 mm and 3/8" O.D. tubing)

**V3** M30 x 2 (for 14 mm and 9/16" O.D. tubing)  
**VU3** 1 1/8" – 12 UNF (for 14 mm and 9/16" O.D. tubing)

### Valve connections

(for valves with integrated air-operator)

**Code** connection

**VJ1** M16 x 1.5 (for 6 mm and 1/4" O.D. tubing)

### Valve body types

The second item of the ordering code indicates the body type of the valve

**Code** Type

**1** 2-way straight  
**2** 2-way angle  
**2R** 2-way angle replaceable seat  
**3** 3-way 2 on pressure  
**4** 3-way 1 on pressure  
**4R** 3-way 1 on pressure replaceable seat

### Valve pressure rating

The last part of the ordering code indicates the pressure rating for which the valve can be used.

**Code** rating

**10** 1000 bar / 15,000 psi  
**21** 2100 bar / 30,000 psi  
**42** 4200 bar / 60,000 psi  
**70** 7000 bar / 100,000 psi  
**100 \*** 10,000 bar / 150,000 psi  
**140 \*** 14,000 bar / 200,000 psi

\* Valves provided with flat cone connection

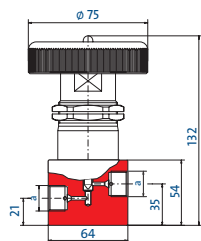
Pressure ratings are based on room temperature. For temperatures lower than -20°C or higher than 80°C consult Resato.

## ORDERING A RESATO HAND-OPERATED VALVE

The ordering codes used in the tables on the following pages specify the connection size, body type and pressure rating.

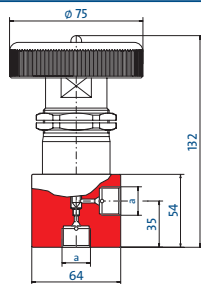
## HAND-OPERATED HIGH-PRESSURE VALVES

Connections M16x1.5 and 9/16"-18 UNF  
For tubing size 6 mm or 1/4" (O.D.)



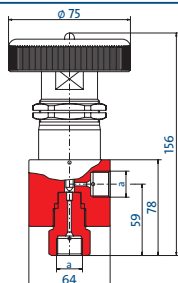
### 2-way straight

| M16x1.5 (a)<br>Ordering code | 9/16"-18 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|-----------------------------------|----------------------------|---------------|
| VI-1-42                      | VU1-1-42                          | 4200 / 60,000              | 2.2           |
| VI-1-70                      | VU1-1-70                          | 7000 / 100,000             | 2.2           |



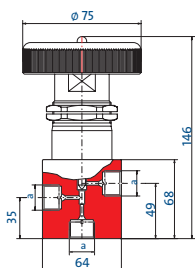
### 2-way angle

| M16x1.5 (a)<br>Ordering code | 9/16"-18 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|-----------------------------------|----------------------------|---------------|
| VI-2-42                      | VU1-2-42                          | 4200 / 60,000              | 2.2           |
| VI-2-70                      | VU1-2-70                          | 7000 / 100,000             | 2.2           |



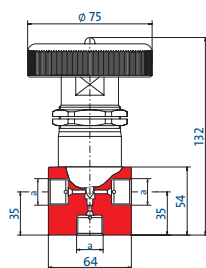
### 2-way angle replaceable seat

| M16x1.5 (a)<br>Ordering code | 9/16"-18 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|-----------------------------------|----------------------------|---------------|
| VI-2R-42                     | VU1-2R-42                         | 4200 / 60,000              | 2.2           |
| VI-2R-70                     | VU1-2R-70                         | 7000 / 100,000             | 2.2           |
| * VI-2R-100***               |                                   | 10,000 / 150,000           | 2.2           |



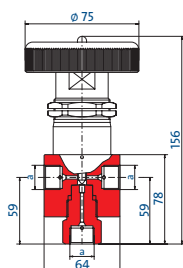
### 3-way 2 on pressure

| M16x1.5 (a)<br>Ordering code | 9/16"-18 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|-----------------------------------|----------------------------|---------------|
| VI-3-42                      | VU1-3-42                          | 4200 / 60,000              | 2.2           |
| VI-3-70                      | VU1-3-70                          | 7000 / 100,000             | 2.2           |



### 3-way 1 on pressure

| M16x1.5 (a)<br>Ordering code | 9/16"-18 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|-----------------------------------|----------------------------|---------------|
| VI-4-42                      | VU1-4-42                          | 4200 / 60,000              | 2.2           |
| VI-4-70                      | VU1-4-70                          | 7000 / 100,000             | 2.2           |



### 3-way 1 on pressure replaceable seat

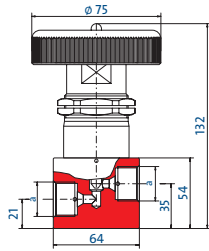
| M16x1.5 (a)<br>Ordering code | 9/16"-18 UNF UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|---------------------------------------|----------------------------|---------------|
| VI-4R-42                     | VU1-4R-42                             | 4200 / 60,000              | 2.2           |
| VI-4R-70                     | VU1-4R-70                             | 7000 / 100,000             | 2.2           |

\* Provided with flat cone  
\*\*\* Only available with air operator N.O.

## HAND-OPERATED HIGH-PRESSURE VALVES

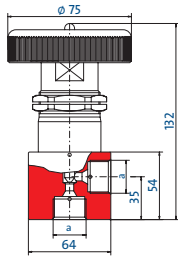
Connections M20x1.5 and 3/4"-16 UNF  
For tubing size 10 mm or 3/8" (O.D.)

### 2-way straight



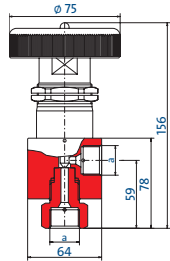
| M20x1.5 (a)<br>Ordering code | 3/4"-16 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|----------------------------------|----------------------------|---------------|
| V2-1-21                      | VU2-1-21                         | 2100 / 30,000              | 5.0           |
| V2-1-42                      | VU2-1-42                         | 4200 / 60,000              | 3.5           |
| V2-1-70                      | VU2-1-70                         | 7000 / 100,000             | 3.5           |

### 2-way angle



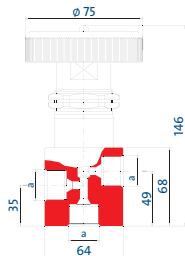
| M20x1.5 (a)<br>Ordering code | 3/4"-16 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|----------------------------------|----------------------------|---------------|
| V2-2-21                      | VU2-2-21                         | 2100 / 30,000              | 5.0           |
| V2-2-42                      | VU2-2-42                         | 4200 / 60,000              | 3.5           |
| V2-2-70                      | VU2-2-70                         | 7000 / 100,000             | 3.5           |

### 2-way angle replaceable seat



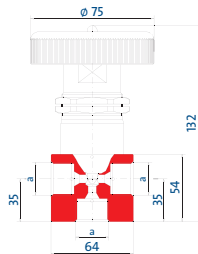
| M20x1.5 (a)<br>Ordering code | 3/4"-16 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|----------------------------------|----------------------------|---------------|
| V2-2R-21                     | VU2-2R-21                        | 2100 / 30,000              | 5.0           |
| V2-2R-42                     | VU2-2R-42                        | 4200 / 60,000              | 3.5           |
| V2-2R-70                     | VU2-2R-70                        | 7000 / 100,000             | 3.5           |

### 3-way 2 on pressure



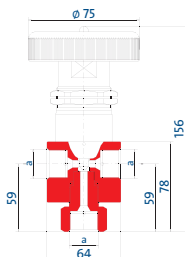
| M20x1.5 (a)<br>Ordering code | 3/4"-16 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|----------------------------------|----------------------------|---------------|
| V2-3-21                      | VU2-3-21                         | 2100 / 30,000              | 5.0           |
| V2-3-42                      | VU2-3-42                         | 4200 / 60,000              | 3.5           |
| V2-3-70                      | VU2-3-70                         | 7000 / 100,000             | 3.5           |

### 3-way 1 on pressure



| M20x1.5 (a)<br>Ordering code | 3/4"-16 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|----------------------------------|----------------------------|---------------|
| V2-4-21                      | VU2-4-21                         | 2100 / 30,000              | 5.0           |
| V2-4-42                      | VU2-4-42                         | 4200 / 60,000              | 3.5           |
| V2-4-70                      | VU2-4-70                         | 7000 / 100,000             | 3.5           |

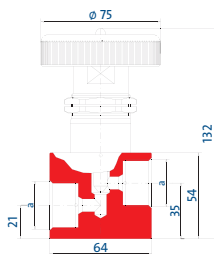
### 3-way 1 on pressure replaceable seat



| M20x1.5 (a)<br>Ordering code | 3/4"-16 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|------------------------------|----------------------------------|----------------------------|---------------|
| V2-4R-21                     | VU2-4R-21                        | 2100 / 30,000              | 5.0           |
| V2-4R-42                     | VU2-4R-42                        | 4200 / 60,000              | 3.5           |
| V2-4R-70                     | VU2-4R-70                        | 7000 / 100,000             | 3.5           |

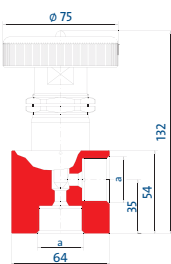
## HAND-OPERATED HIGH-PRESSURE VALVES

Connections M30x2 and 1 1/8"-12 UNF  
For tubing size 14 mm or 9/16" (O.D.)



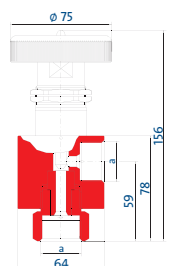
### 2-way straight

| M30x2 (a)<br>Ordering code | 1 1/8"-12 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|----------------------------|------------------------------------|----------------------------|---------------|
| V3-1-10                    | VU3-1-10                           | 1000 / 15,000              | 10            |
| V3-1-21                    | VU3-1-21                           | 2100 / 30,000              | 8             |
| V3-1-42                    | VU3-1-42                           | 4200 / 60,000              | 5             |



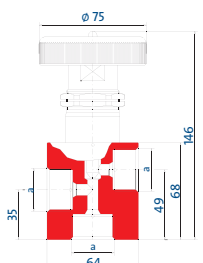
### 2-way angle

| M30x2 (a)<br>Ordering code | 1 1/8"-12 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|----------------------------|------------------------------------|----------------------------|---------------|
| V3-2-10                    | VU3-2-10                           | 1000 / 15,000              | 10            |
| V3-2-21                    | VU3-2-21                           | 2100 / 30,000              | 8             |
| V3-2-42                    | VU3-2-42                           | 4200 / 60,000              | 5             |



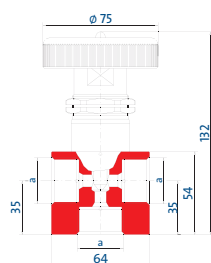
### 2-way angle replaceable seat

| M30x2 (a)<br>Ordering code | 1 1/8"-12 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|----------------------------|------------------------------------|----------------------------|---------------|
| V3-2R-10                   | VU3-2R-10                          | 1000 / 15,000              | 10            |
| V3-2R-21                   | VU3-2R-21                          | 2100 / 30,000              | 8             |
| V3-2R-42                   | VU3-2R-42                          | 4200 / 60,000              | 5             |



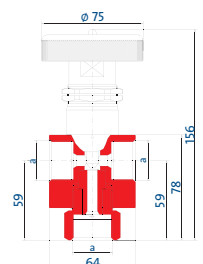
### 3-way 2 on pressure

| M30x2 (a)<br>Ordering code | 1 1/8"-12 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|----------------------------|------------------------------------|----------------------------|---------------|
| V3-3-10                    | VU3-3-10                           | 1000 / 15,000              | 10            |
| V3-3-21                    | VU3-3-21                           | 2100 / 30,000              | 8             |
| V3-3-42                    | VU3-3-42                           | 4200 / 60,000              | 5             |



### 3-way 1 on pressure

| M30x2 (a)<br>Ordering code | 1 1/8"-12 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|----------------------------|------------------------------------|----------------------------|---------------|
| V3-4-10                    | VU3-4-10                           | 1000 / 15,000              | 10            |
| V3-4-21                    | VU3-4-21                           | 2100 / 30,000              | 8             |
| V3-4-42                    | VU3-4-42                           | 4200 / 60,000              | 5             |



### 3-way 1 on pressure replaceable seat

| M30x2 (a)<br>Ordering code | 1 1/8"-12 UNF (a)<br>Ordering code | Pressure rating<br>bar/psi | Orifice<br>mm |
|----------------------------|------------------------------------|----------------------------|---------------|
| V3-4R-10                   | VU3-4R-10                          | 1000 / 15,000              | 10            |
| V3-4R-21                   | VU3-4R-21                          | 2100 / 30,000              | 8             |
| V3-4R-42                   | VU3-4R-42                          | 4200 / 60,000              | 5             |



## AIR-ACTUATED VALVES TYPE V

All Resato valves type V can be supplied with piston type air actuators for remote on/off operations or for uses in relief valve and "fail-safe" shut-off systems. Two sizes of air actuators (160 and 200 mm) are offered to meet the service requirements. Both normally open (air-to-close, actuator type O) and normally closed (air-to-open, actuator type C) are available.

Air-operated valves can be controlled by a 3-way manual pneumatic valve or by a pneumatic solenoid valve. Air-operated valves permit process control from a remote control panel or a computer-controlled system without the necessity of piping high-pressure lines to the control panel. Safety is greatly increased.

One of the advantages of air-operated valves is that the valves will always be operated with the same operation force caused by the air pressure. The risk of damaging a seat or needle is considerably smaller than with hand-operated valves.

There are four types of air actuators.

Normally open (air – to – close): O-160  
O-200

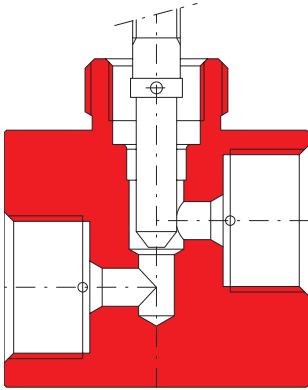
Normally closed (air – to – open): C-160  
C-200

Next page shows the different body types which can be supplied with an air actuator.



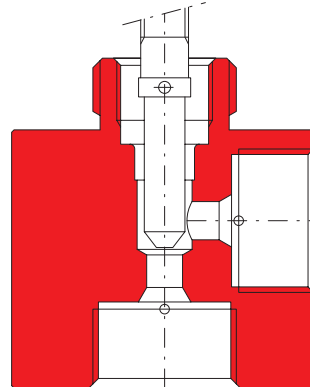
## BODY TYPES AIR-ACTUATED VALVES TYPE V

1



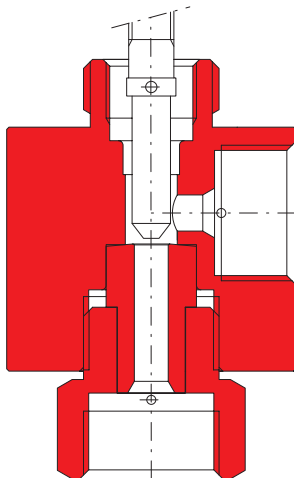
2-way straight

2



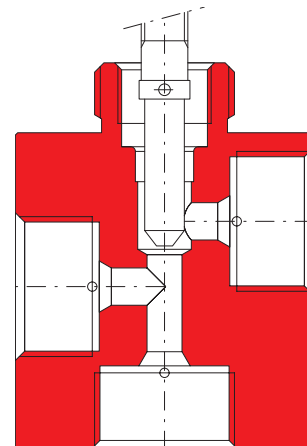
2-way angle

2R



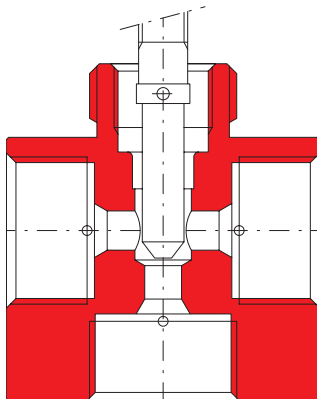
2-way angle replaceable seat

3



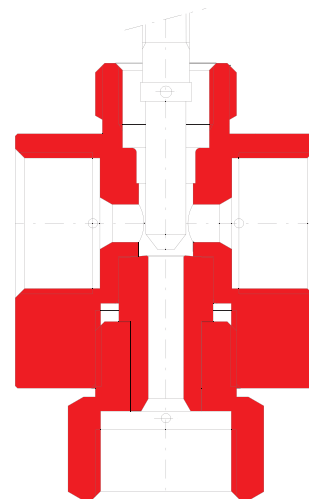
3-way 2-on pressure

4



3-way 1-on pressure

4R



3-way 1-on pressure replaceable seat

For dimensions see hand-operated valves.

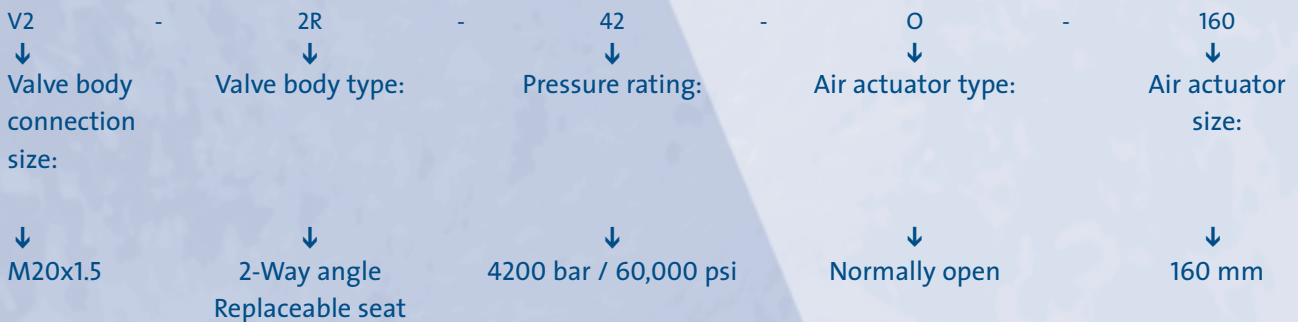
## ORDERING INFORMATION AIR-ACTUATED VALVES TYPE V

The ordering codes used in the following tables specify the connection size, body type, pressure rating and air actuator type and size.

| M16x1.5 (a)<br>Ordering code | 9/16-18 UNF (a)<br>Ordering code  | Pressure rating<br>bar                  psi | Orifice | Max. air pressure<br>bar/psi |
|------------------------------|-----------------------------------|---|---------|------------------------------|
| V1-x°-42-x°° - 160           | VU1-x° - 42-x°°-160               | 4200 / 60,000                               | 2.2     | 4.5 / 65                     |
| V1-x°-70-x°° - 160           | VU1-x° - 70-x°°-160               | 7000 / 100,000                              | 2.2     | 4.5 / 65                     |
| V1-x°-100-x°° -160*          | VU1-x° -100-x°°-160               | 10,000 / 150,000                            | 2.2     | 5.5 / 80                     |
| M20x1.5 (a)<br>Ordering code | 3/4-16 UNF (a)<br>Ordering code   | Pressure rating<br>bar                  psi | Orifice | Max. air pressure<br>bar/psi |
| V2-x°-21-x°° - 160           | VU2-x° - 21-x°°-160               | 2100 / 30,000                               | 5.0     | 4.5 / 65                     |
| V2-x°-42-x°° - 160           | VU2-x° - 42-x°°-160               | 4200 / 60,000                               | 3.5     | 4.5 / 65                     |
| V2-x°-70-x°° - 160           | VU2-x° - 70-x°°-160               | 7000 / 100,000                              | 3.5     | 4.5 / 65                     |
| M30x2 (a)<br>Ordering code   | 1 1/8-12 UNF (a)<br>Ordering code | Pressure rating<br>bar                  psi | Orifice | Max. air pressure<br>bar/psi |
| V3-x°-10-x°° - 160           | VU3-x° - 10-x°°-160               | 1000 / 15,000                               | 10      | 5 / 70                       |
| V3-x°-21-x°° - 200           | VU3-x° - 21-x°°-200               | 2100 / 30,000                               | 8       | 5 / 70                       |
| V3-x°-42-x°° - 200           | VU3-x° - 42-x°°-200               | 4200 / 60,000                               | 5       | 4.5 / 65                     |

° Body type to be specified   °° Air actuator normally open (O) or normally closed (C) to be specified. \* Provided with flat cone

### ORDERING EXAMPLE

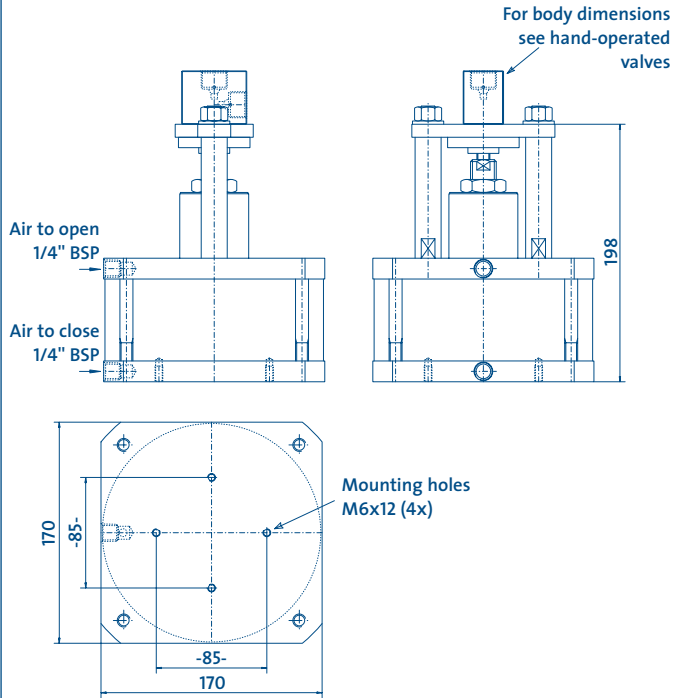


### OPTIONS:

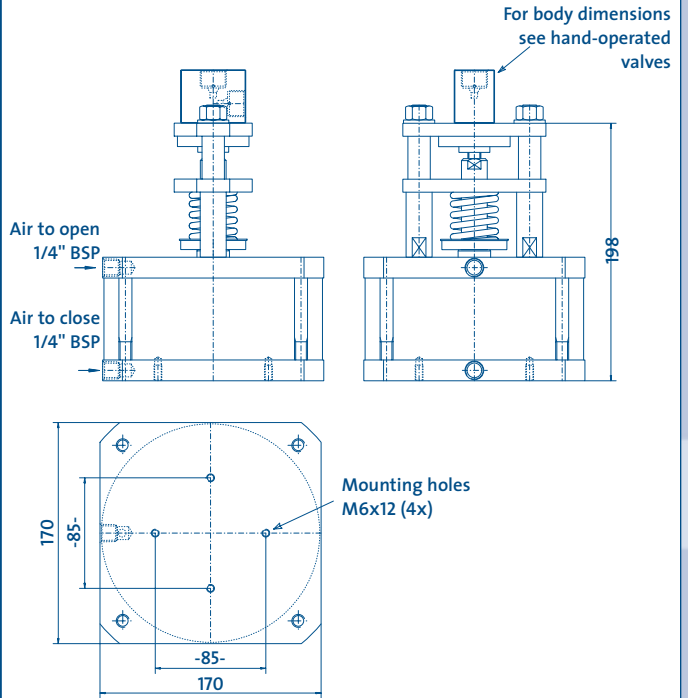
All valves with air actuators can be provided with a contact-free limit switch for position indication. In this case "LS" has to be added to the ordering code. For example: V2-2R-42-O-160-LS.

## DIMENSIONS AIR-ACTUATED VALVES

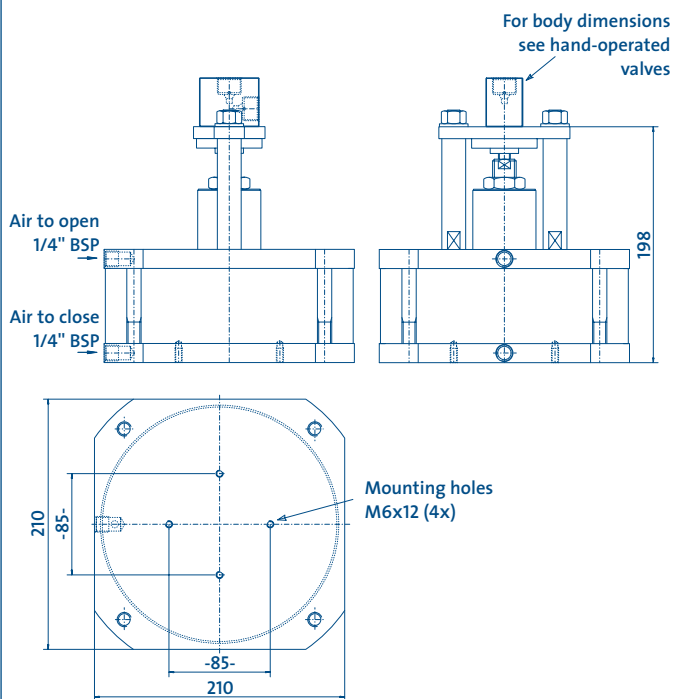
Vx-x-xx-C-160



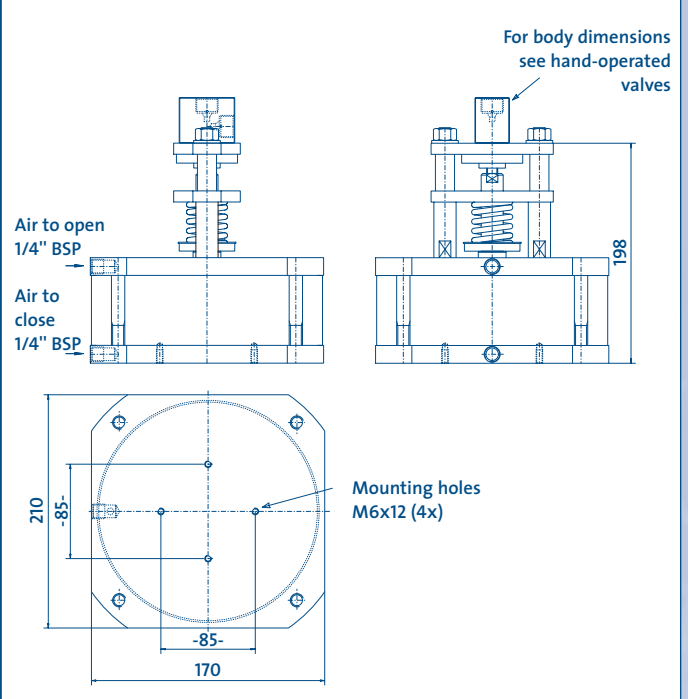
Vx-x-xx-O-160



Vx-x-xx-C-200



Vx-x-xx-O-200



## AIR-ACTUATED VALVES, TYPE VJ1 (WITH INTEGRATED AIR ACTUATOR)

Resato has designed a special line of air-operated valves in which very small valve dimensions (orifice 1.2 mm) are combined with excellent switching performance. These valves are particularly suited for very high pressures. They are standard provided with replaceable seat.

Valves can be supplied with a single air actuator for pressures up to 4200 bar (60,000 psi) and a multi-air actuator for pressures up to 14,000 bar (200,000 psi). The standard inside diameter of the actuator is 60 mm.

Depending on valve type, we offer normally closed (air-to-open) actuators, type C, or double air-actuated, type DO.

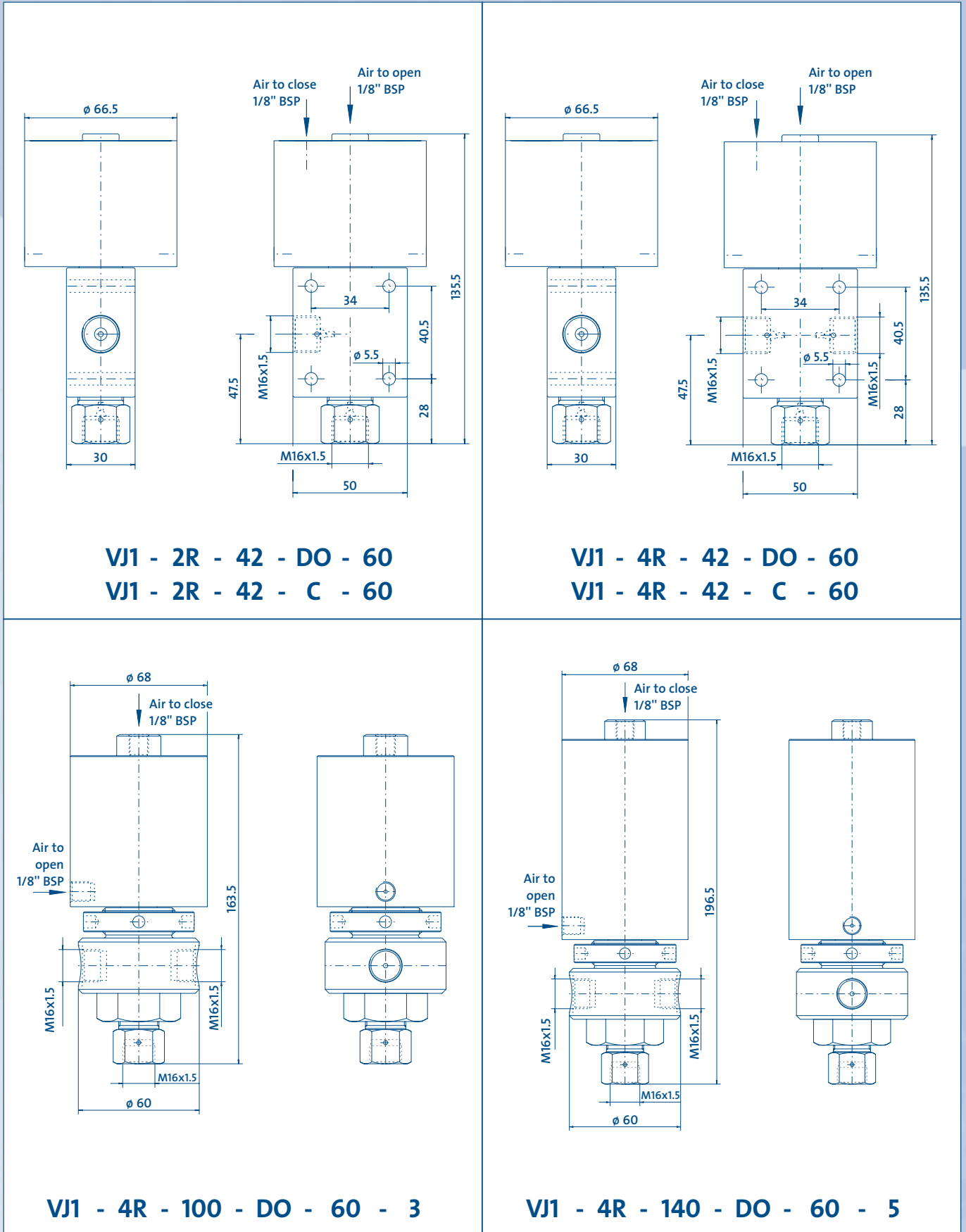


## ORDERING CODE TABLE

| Description                                | Ordering code       | Pressure rating<br>bar/psi | Orifice | Max. air<br>pressure bar | Actuator<br>type |
|--|---------------------|----------------------------|---------|--------------------------|------------------|
| 2-way angle<br>replaceable seat            | VJ1-2R-42-DO-60     | 4,200 / 60,000             | 1.2     | 4                        | DO               |
|  | VJ1-2R-42-C-60      | 4,200 / 60,000             | 1.2     | 4                        | C                |
| 3-way<br>1 on pressure<br>replaceable seat | VJ1-4R-42-DO-60     | 4,200 / 60,000             | 1.2     | 4                        | DO               |
|  | VJ1-4R-42-C-60      | 4,200 / 60,000             | 1.2     | 4                        | C                |
| 3-way<br>1 on pressure<br>replaceable seat | *VJ1-4R-100-DO-60-3 | 10,000 / 150,000           | 1.2     | 10                       | DO               |
|  | *VJ1-4R-140-DO-60-5 | 14,000 / 200,000           | 1.2     | 10                       | DO               |

\* Provided with flat cone

## DIMENSIONS AIR-ACTUATED VALVES, TYPE VJ1





## EXAMPLES OF RESATO HIGH-PRESSURE COMPONENTS UP TO 14,000 BAR

Air-driven pumps and gas boosters  
Hydraulically-driven pumps and gas boosters  
Fittings  
General-purpose valves  
Check valves  
Swivels  
Hoses  
Tubing  
Pressure transducers  
Rupture-disc safety devices  
Quick connectors

## EXAMPLES OF RESATO HIGH-PRESSURE EQUIPMENT AND SYSTEMS

Portable pressure-test systems  
Test equipment for hoses (safety) valves, fittings etc.  
Computer-controlled high-pressure test equipment  
Autofrettage systems  
Autoclaves  
Custom-made test equipment  
Water-jet cutting systems  
High-pressure food preservation systems  
PC data acquisition and recording systems

## COMPANY PROFILE RESATO

Founded in 1985, Resato International B.V. is wholly specialized in the design and manufacture of high-pressure components and systems for pressures of up to 14,000 bar (200,000 psi).

At our modern manufacturing plant in Roden, The Netherlands, we have our own engineering and R&D departments as well as sophisticated production facilities. These enable us to furnish precisely the right component or system a client may need.



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Please note that general data and specifications given in this brochure are subject to change without notice. Feel free to contact our sales department if you need more definite information.