3/2 Piloted Poppet Valve Datasheet

Safety Integrity Level
SIL 3
IEC 61508 / IEC 61511

VD3 Series

Up to 450 L/min

Up to 355 Barg

Zero Leakage (< 1 drop per minute)

Aisi 316L stainless steel

Exotic materials on request

• Technical specification

Materials of construction

Body	**SS316L (Special version on request)***
Internals	**SS316L – 17/4 PH**
Seals	**NBR – HNBR – VITON – FLUOROSILICON - PTFE**
Screws	**A4-70**

***exotic materials i.e. 6Mo , Hastelloy® C276 , Inconel® 625 …**

Media

Mineral oils (advised max 500 cst)

Water glycol

(Please contact for special Media and viscosity range)

Working pressure

355 BARG - NBR – VITON – HNBR

250 BARG - FLUOROSILICON

Pneumatic / hydraulic low pressure pilot version (Max pilot pressure 12 barg)

Working Ambient Temperature and environment

NBR	**-30°C /**	**+80°C**
HNBR	**-40°C /**	**+80°C**
VITON	**-20°C /**	**+120°C**
FLUOROSILICON	**-60°C /**	**+60°C**

Max Relative Humidity 100% , Direct exposure to sunlight,

Atmospheric Pressure 500 mbar ÷ 1200mbar

Installation

Minimum level Oil cleanliness requested 19/15 ISO 4466

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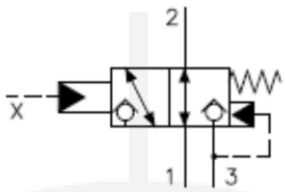
• Port Configurations

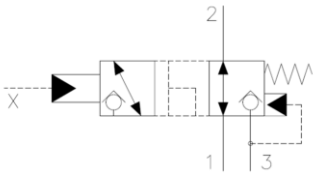
VD3 pilot valves series are universal 3 ports 2 positions spring return valves.



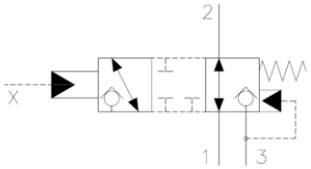
All ports accept fluid in pressure and can be used as per Normally Open or Normally Close function:

- **Normally Open**
  Pressure Line PORT1 Actuator Line PORT2 Discharge Line PORT3
  The line "3" (high pressure) open on the line "2" (actuator) and the line "1" is in communication with the discharge
- **Normally Close**
  Pressure Line PORT3 Actuator Line PORT2 Discharge Line PORT1
  The line "3" normally closed (high pressure), the line "2" (actuator) in communication with the line "1" (discharge)

The valve are available in open ports or close ports (block before bleed) configuration.



Open ports



close ports

• STORAGE AND TRASPORTATION

	NBR-HNBR	VITON	FLUOROSILICON
Min / Max Temperature [°C]	-40 °C ÷ +80 °C	-20 °C ÷ +120 °C	-60 °C ÷ +60°C
Max Relative Humidity	100%	100%	100%
Exposure to sunlight	admitted	admitted	admitted
Dust Contamination	19/15 ISO 4466 (25µ absolutes)	19/15 ISO 4466 (25µ absolutes)	19/15 ISO 4466 (25µ absolutes)
Atmospheric Pressure	500mbar ÷ 1200mbar	500mbar ÷ 1200mbar	500mbar ÷ 1200mbar

• Coding information

A								COSTANT
VD3								SERIES
	X	SS316L						EXTERNAL MATERIAL
	Z	SPECIAL						
		06	DN6					NOMINAL DIAMETER SIZE
		10	DN10					
		13	DN13					
		16	DN16					
		20	DN20					
		25	DN25					
		99	SPECIAL					
			1	HIGH PRESSURE (SUBBASE PILOT)				PILOT
			2	HIGH PRESSURE (EXTERNAL PILOT)				
			3	LOW PRESSURE				
			Z	SPECIAL				
				N	NBR			SEAL MATERIAL
				H	HNBR			
				V	VITON			
				F	FLUOROSILICON			
				Z	SPECIAL			
					1	SUBBASE		MOUNTING/CONNECTIONS
					2	¼" NPT (DN6)		
					2	3/8" NPT (DN10)		
					2	1/2" NPT (DN13)		
					2	3/4" NPT (DN16)		
					2	1" NPT (DN20/25)		
					3	¼" BSPP (DN6)		
					3	3/8" BSPP (DN10)		
					3	1/2" NPT BSPP (DN13)		
					3	3/4" NPT BSPP (DN16)		
					3	1" BSPP (DN20/25)		
					Z	SPECIAL		
						A	OPEN PORTS (negative coverage)	SPOOL VERSION
						B	CLOSED PORTS (positive coverage – block before bleed)	
							JJ	SEQUENTIAL NUMBER FOR SPECIAL VERSIONS
AVD3	X	10	1	N	1	A	00	EXAMPLE
3/2 VALVE BODY AISI 316L DN 10 mm SUBBASE PILOT – NBR SEALS – SUBBASE MOUNTING – OPEN CENTRE								

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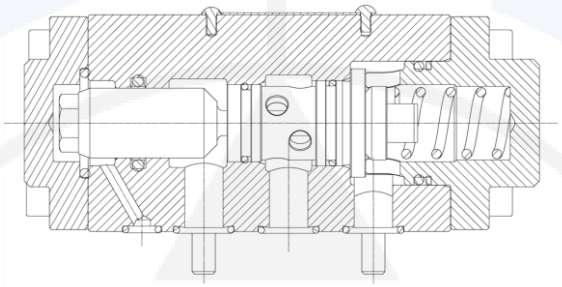
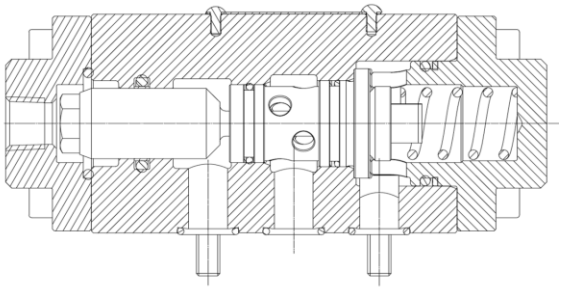
• PILOT OPERATORS

The drive of the valve is obtained by means of hydraulic pilot form the mouth "X", which can be a plate (TYPE A) or external tube (TYPE B).

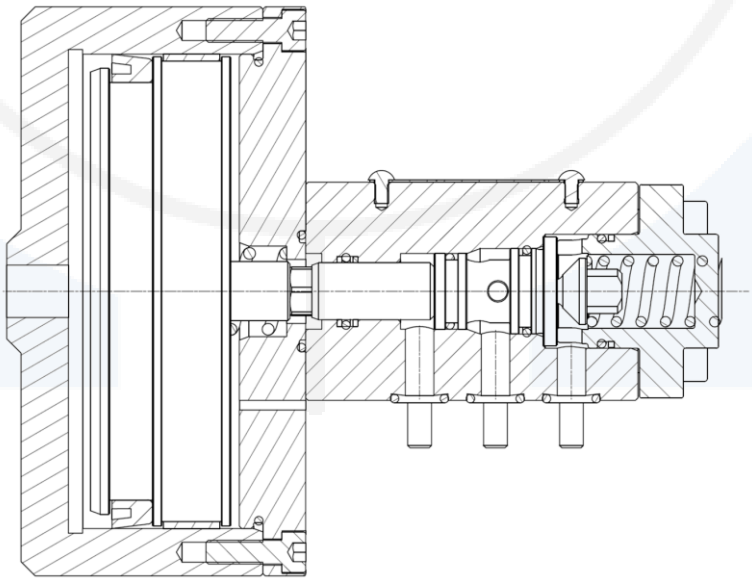
- **TYPE A (INTERNAL PILOTING)**



- **TYPE B (EXTERNAL PILOTING)**



- **TYPE C (EXTERNAL PILOTING – LOW PRESSURE)**



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Certificate of Inspection (Page 1/2)

Certificate No. **19_OR150_OLE_ADV3H_184_2019**

Issued October 7th, 2019

Object of Inspection	3/2 PILOTED POPPET VALVE VD3 SERIES
Applicant	OLEODINAMICA REVA SRL, Via Isacchi, 3-42 124 Reggio Emilia (Italy)
Engineering	OLEODINAMICA REVA S.r.l., Via Isacchi, 3-42 124 Reggio Emilia (Italy)
Manufacturing	OLEODINAMICA REVA S.r.l., Via Isacchi, 3-42 124 Reggio Emilia (Italy)
System Architecture	As defined in: *3/2 Piloted Poppet Valve VD3 Series Technical Datasheet DS-VD3-01 Rev. 02.19*
Equipment type	MECHANICAL EQUIPMENT
Inspection Requirements	IEC 61508:Ed. 2 - 2010 Functional safety of electrical/electronic/programmable electronic safety-related systems IEC 61511: Ed. 2 - 2016 Functional safety – Safety instrumented systems for the process industry sector
Inspection Result	BUREAU VERITAS ITALY states that the 3/2 PILOTED POPPET VALVE VD3 SERIES are suitable for use of up to SIL 3 in De-energized mode Safety Functions and in Energized mode of up to SIL 2 as a Single device (HFT=0), Table A and of up to SIL 3 as a redundant device (HFT=1) Safety Functions, Table B. Route 1H, route 2H apply. Route 1S applies. Systematic capability (SC) 3 IEC 61511 Ed. 2: 2016, Part 1, §11.4.3 clause (2nd bullet) is also respected.
Restrictions/ Conditions	As per Safety Manual 79.000.008 SFM - Safety Manual VD3 and Safety Analysis Report code: 19_OR150_OLE_ADV3H_AS01 V1.0

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Certificate of Inspection (Page 2/2)

Certificate No **19_OR150_OLE_ADV3H_184_2019**

DE-ENERGIZED SAFETY FUNCTION	λ t	λ d	λ dd	λ s	ARCHITECTURAL CONSTRAINTS	HFT	SIL
CASE 1a: VALVE N.C.	5,23E-08	8,37E-11	8,37E-11	5,22E-08	ROUTE 1H	0	3
CASE 2b: VALVE N.O.	5,23E-08	4,13E-09	4,13E-09	4,82E-08			

Table A – 3 /2 Piloted Poppet Valves DE-ENERGIZED Safety function failure rates, HFT, SIL

ENERGIZED SAFETY FUNCTION	λ t	λ d	λ dd	λ s	ARCHITECTURAL . CONSTRAINTS	HFT	SIL
CASE 1b: VALVE N.C.	5,23E-08	5,23E-08	5,23E-08	0.0	ROUTE 2H	0	2
						1	3
CASE 2a: VALVE N.O.	5,23E-08	2,03E-08	2,03E-08	3,20E-08	ROUTE 1H/2H	0	2
						1	3

Table B – 3 /2 Piloted Poppet Valves ENERGIZED Safety function failure rates, HFT, SIL

List of Evaluated Documents	The reference List is contained in the Safety Analysis Report 19_OR169_ATS_SIL31_AS01 V1.0 The report issued by Bureau Veritas Italia S.p.A. is an integral part of this Inspection Certificate.
Validity	This certificate is valid until *October 6th, 2022* as long as the Object of Inspection and the relevant technical documentation are not modified. BVI must be informed about any modifications without delay.
Date of first issue *October 7th, 2019*	*Signature*

Name: Tommaso Ghiara *Title*: General Manager

On behalf of Bureau Veritas Italia, Viale Brigata Bisagno, 2/41 - 16129 Genova – Italy

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