





OILGEAR™

VPE

PREFILL & EXHAUST VALVES

Innovative Fluid Power



OILGEAR

MAKING MACHINES GO AND PROBLEMS GO AWAY®

THE WORLD DEMANDS OILGEAR

Oilgearhasa richlegacy of more than100 years manufacturing pumps and hydraulic equipment. We pride ourselves on **MAKING MACHINES GO AND PROBLEMS GO AWAY®**. For decades, Oilgear has developed hydraulic techniques to meet the unique needs for many equipment manufacturers and end users worldwide.



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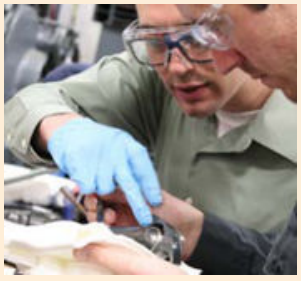
Global Service Network

No matter where you are, Oilgear can quickly and efficiently provide service to you.

Oilgear's large pump manufacturing centers are in Traverse City, Michigan and Leeds, England. Further domestic manufacturing capacity and product specialization are provided by our Fremont, Nebraska, pump manufacturing facility.We also have manufacturing and field service centers in Germany, France, Spain, China and Korea.

Engineering and Application Expertise

Oilgear's engineering capabilities are second to none. Our application and field engineers are factory-trained and have spent years, often decades, working in the market segments they service. Every Oilgear engineer brings this personal experience to the meeting table, plus the collective knowledge gained from Oilgear's more than 100 years of servicing the general industry with innovative fluid power solutions.

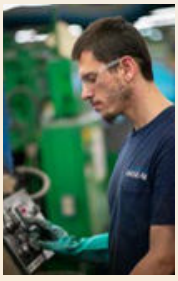





TABLE OF CONTENTS

VPE Application, Features and Benefits 4

VPE Operation 5

General Technical Data, Size Designation 6

Model Ordering Information 7

Flow Graph 8-9

Mounting Pattern - Valve Sizes 10

Preferred Valve Codes, Valve Symbols 11

Installation Dimensions Versions CB and CP Standard Range

Dimension Specifications 12

For Valve Size 40, 50, 65, and 90 13

For Valve Size 130, 190, 250, and 300 14

For Valve Size 350, 400, and 450 15

Installation Dimensions Version CT

For Valve Size 130, 190, 250, and 300 16

For Valve Size 350, 400, and 450 17

Installation Dimensions Version CC

For Valve Size 130, 190, 250, and 300 18

For Valve Size 350, 400, and 450 19

Installation Dimensions Version CL

For Valve Size 130, 190, 250, and 300 20

Weight: Standard Version 21

Proximity Switch Wiring 22

Position Transducer 23

Special Designs 24

Vintage Replacement / Conversion Kits 24

VPE APPLICATION

PREFILLING

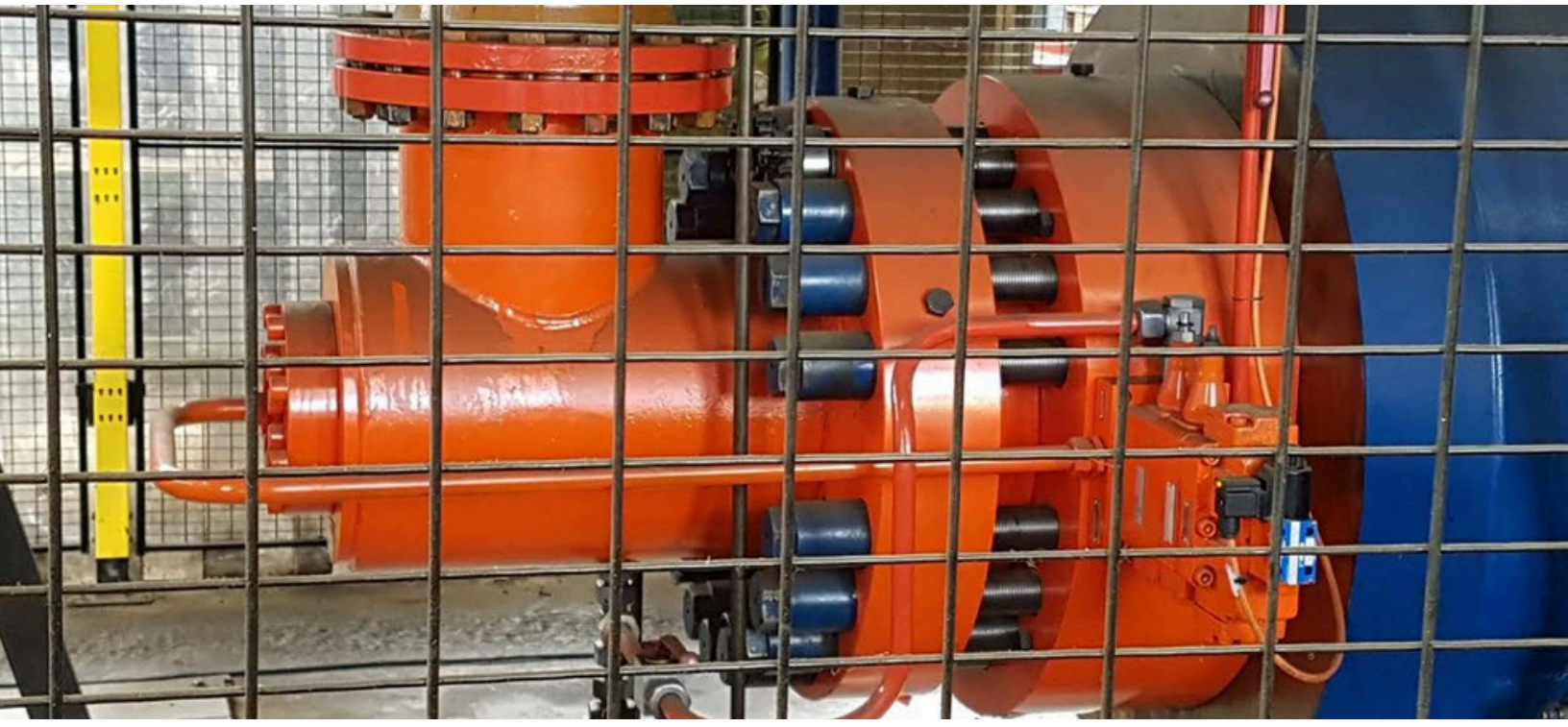
The valve is used to connect a cylinder to a gravity or low pressure fluid supply (tank) and allow the cylinder to be filled with fluid when the ram is being withdrawn from the cylinder by means other than the hydraulic fluid applied to the ram, and where the speed is greater than that which can be achieved by the system pump flow. After prefilling, the valve automatically closes. This prevents pump flow into the tank, so that cylinder movement continues at a speed relevant to the pumped volume.

EXHAUST

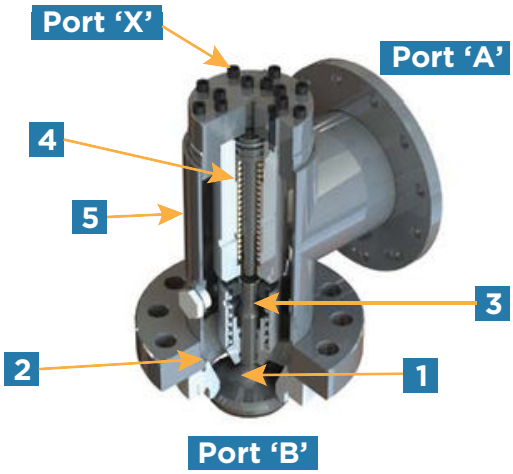
Open the valve, using the pilot piston after pressure in the cylinder has been decompressed to a level which will prevent shock, to allow large volumes of oil to be quickly returned to the tank without the need to pass through the rest of the system.

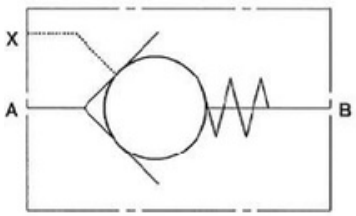
FEATURES AND BENEFITS

- Seated design for low leakage
- Guided valve design:
  - Allows for use on various fluids, 1 to 800 cst.
  - Increased seating capability, virtually leak free. Good for locking in pressure
- Precision machined seat giving controlled seat width and constant opening pressures throughout the life of the valve and consistent operation form one valve to another
- Metal to metal seat for increased dirt tolerance and leak free operation
- Main valve and pilot piston are not connected giving automatic valve closing at the end of prefill mode
- Horizontal or vertical mounting
- In-Tank, straight line or 90° bend mounting options on request
- Optional valve position switch









SYMBOL
(Typical)

VPE OPERATION

All Oilgear prefill valves are similar in design, construction and operation. Detail differences in construction are relative to the size of the valves. The valves can be simply described as consisting of three sub-assemblies. The main headed valve with seat and closing spring, the pilot piston assembly and the casing with low pressure connection.

The main headed valve is fitted with a spring to return the valve to its closed position. However, this spring is also designed to keep the pressure drop low in order to enable the valve to open naturally during the prefill cycle, and may prevent flow to other or lower parts of the system from the tank. The operating piston which is used to open the valve during return is not connected to the main poppet, and can only push the valve open. Valve sizes 40 to 300 mm use a strong spring on the pilot piston to drive the piston back to position independent to the main poppet. The large 350 to 450 mm size valves have a two way hydraulically operated pilot actuator as a spring return becomes impractical. These two methods of returning the pilot piston give positive action without influencing the low pressure drop characteristics of the valve. Unlike other valves where the main valve and the pilot piston are connected, the timing of this return operation is not critical as the main poppet can remain naturally open when the pilot piston is retracted.

Some valves can be fitted with a proximity switch to indicate that the valve is closed. The switch is locked in a removable housing which can be turned to provide a small final signal setting. The switch can only be set to operate prior to closing position to ensure a positive signal and is therefore not an absolute true indication of the valve being closed. To suit individual requirements, valves can be mounted in a customers' special housing or press head. The valve consists of: Main Valve Poppet (1), Seat (2), Main Spring (3), Pilot Piston (4) and Case (5).

PREFILLING

When the pressure at Port B falls to create a differential across the valve (from port A to port B) which is sufficient to overcome the force of the Main Spring (3), the Main Valve Poppet (1) will open allowing free flow from Port A to Port B.

EXHAUSTING

The pressure acting on Port B holds the Main Valve Poppet (1) on the Seat (2), keeping the valve closed. To allow flow in the return direction (from Port B to Port A) the pressure at Port B must first be decompressed to a level which will not cause shocks in the system. Pressure can then be applied to Port X, the Pilot Piston (4) is then forced down, opening the Main Valve Poppet (1), allowing exhaust flow from Port B to Port A.

VPE GENERAL TECHNICAL DATA

Valve Design		Surface (Oilgear) Design, Seated Type
Mounting Type		Cylinder and Line Mounting
Mounting Pattern		Oilgear Standard
Installation Position		Vertical (Poppet Down) or Horizontal
Ambient Temperature Range	**Valve with NBR Seals**	-20°C to 80°C
	Valve with FKM Seals	-30°C to 80°C
Hydraulic Technical Data	**Max. Operating Pressure**	350, 500, 700 and 1000 BAR Depending on Size.
	Flow Direction	Prefill A to B, and Exhaust B to A
Seal Material / Fluid Combination	**NBR**	Mineral Oil Based Hydraulic Fuids, HFB HFC Hydraulic Fluids
	FKM	Mineral Oil Based Hydraulic Fluids, HFD Hydraulic Fluids
Temperature Range of Fluid	**NBR**	-20°C to 80°C
	FKM	-30°C to 80°C
Viscosity of Fluid	**Permitted**	1 to 800 CST
	Recommended	10 to 200 CST
Flitration	**For Functional Safety**	20/18/15 Up to 500 BARS: 20/16/13 Over 500 BARS
	For Longer Service Life	18/16/13 Up to 500 BARS: 18/13/11 Over 500 BARS

VPE SIZE DESIGNATION

Nominal Size (mm)	Max. Flow Prefilling CB and CP Version (l/min)	Max. Flow Prefilling CT Version (l/min)	Max Flow Exhausting (All Versions Except CC) (l/min)	Max. Tank Pressure (BAR) CB and CL Versions	Max. Tank Pressure (BAR) CP and CN Versions	Pilot Pressure to Open Valve (BAR) (P=Cylinder Pressure)	Ratio Main Valve to Pilot Piston	Volume Port X (cm3)	Volume Port Y (cm3)
40	255	330	600	15	-	P+3,4+Tank	1:1	17	-
50	450	585	1050	15	-	1.7P+3,7+Tank	1,63:1	17	-
65	700	910	1645	15	-	2,1P+3,6+Tank	2:1:1	17	-
90	1400	1820	3200	15	-	5,6P+4,8+Tank	2:1:1	17	-
130	3400	4420	7500	3.5	16	6P+6,2+Tank	5:6:1	97.5	-
190	7500	9750	17600	3.5	16	6P+4+Tank	6:1	226	-
250	11900	15470	30500	3.5	16	7,8P+5+Tank	7:8:1	506	-
300	20000	26000	45000	3.5	16	10,3P+5+Tank	10,3:1	506	-
350	26000	33800	65000	3.5	16	11P+5+Tank	11:1	785	545
400	34000	44200	85000	3.5	16	11P+5+Tank	11:1	1195	687
450	37000	48100	100000	3.5	16	11P+5+Tank	11:1	1860	968



VPE MODEL ORDERING INFORMATION

VALVE EXAMPLE	V	P					–					HK		M		*
BLOCK NUMBER	1	2	3	4	5	6	–	7	8	9	10	11	12	13	14	15

1 = VALVE TYPE	
V	Valve

2 = VALVE FORM	
P	Prefill

3 = VALVE TYPE	
E	Prefill and Exhaust
P	Prefill Only

4 = VARIATION

		40	50	65	90	130	190	250	300	350	400	450
CB	90° BEND											
CL	LINE	-	-	-	-							
CT	CT	-	-	-	-							
CC	CHECK VALVE ONLY											
CP	HIGH PRESSURE 90° CASE	-	-	-	-							
CN	HIGH PRESSURE in line CASE	-	-	-	-							
XX	SPECIAL											

Standard Available On Request - Not Available

5 = NOM SIZE	
40	40 mm
50	50 mm
65	65 mm
90	90 mm
130	130 mm
190	190 mm
250	250 mm
300	300 mm
350	350 mm
400	400 mm
450	450 mm

6 = MOUNTING	
B	With 90° Bend Only, 40, 50, 65, 90, 130, 300, 350, 400, & 450 Sizes
C	Only 190, 250 Sizes
N	WIth Check Valve Only

7 = WITH PRESSURE

		40	50	65	90	130	190	250	300	350	400	450
35	350 BARS	-	-	-	-		-	-	-			
42	420 BARS	-	-	-	-	-	-	-	-	-		
50	500 BARS	-	-									
70	700 BARS											
100	1000 BARS								-	-	-	-
140	1400 BARS						-	-	-	-	-	-
XX	SPECIAL											

Standard Extended Range On Request - Not Available

8 = EXHAUST FLANGE	
A	CB, CP, CL and CN
N	CC and CT

9 = MATING FLANGE	
M	WithMatingFlangeand Fasteners
N	Without MatingFlange

10 = PILOT CONNECTION	
B	For Use With Prefill and Exhaust "VPE", Sizes 40,50, 65, 90, 130, 190, 250, 300
F	For Use with Prefill and Exhaust "VPE", Sizes 350,400, and 450
N	For Use with "Prefill Only" VPP

11 = RATIO & SPRING	
HK	Assigned by Factory

12 = ADDITIONS	
L	PositionTransducer
K	Proximity Switch and Position Transducer
P	ProximitySwitch
N	None

13 = DIMENSIONS	
M	Metric

14 = SEALS	
B	Buna NBR
E	EPDM
V	Viton

15 = DESIGN SERIES	
*	Assigned by Factory

For non-standard requests, please contact technical sales.

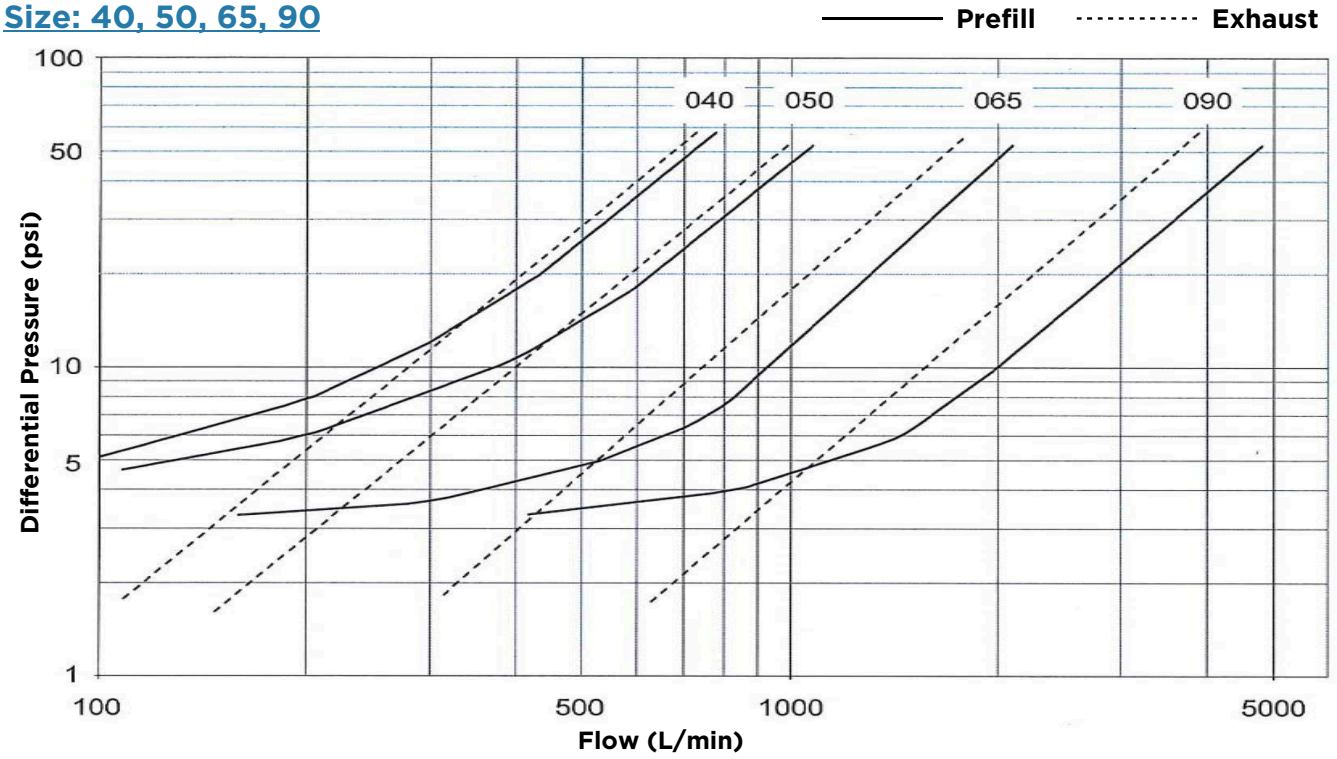


FLOW GRAPH - PREFILL / EXHAUST

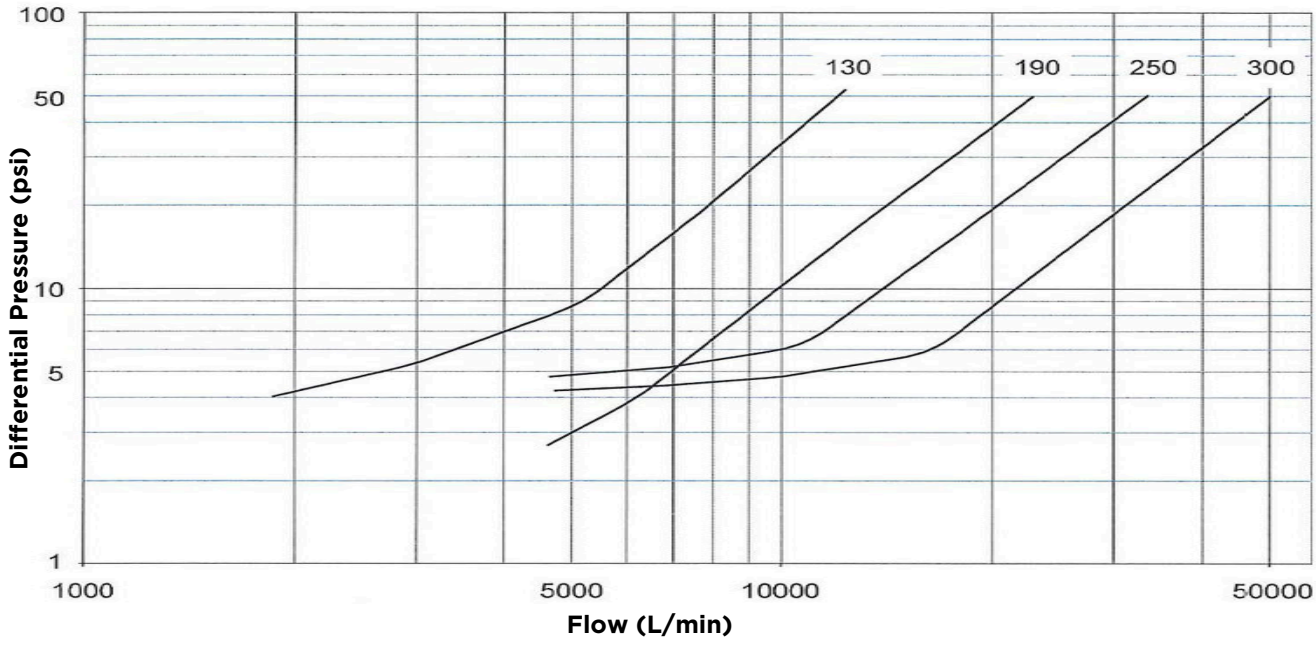
Prefill (Flow A to B) Exhaust (Flow B to A)

Valve mounted horizontally, VPE CB type.
The values of flow and pressure are for an oil viscosity of 40 cst at 40°C

Size: 40, 50, 65, 90



Size: 130, 190, 250, 300



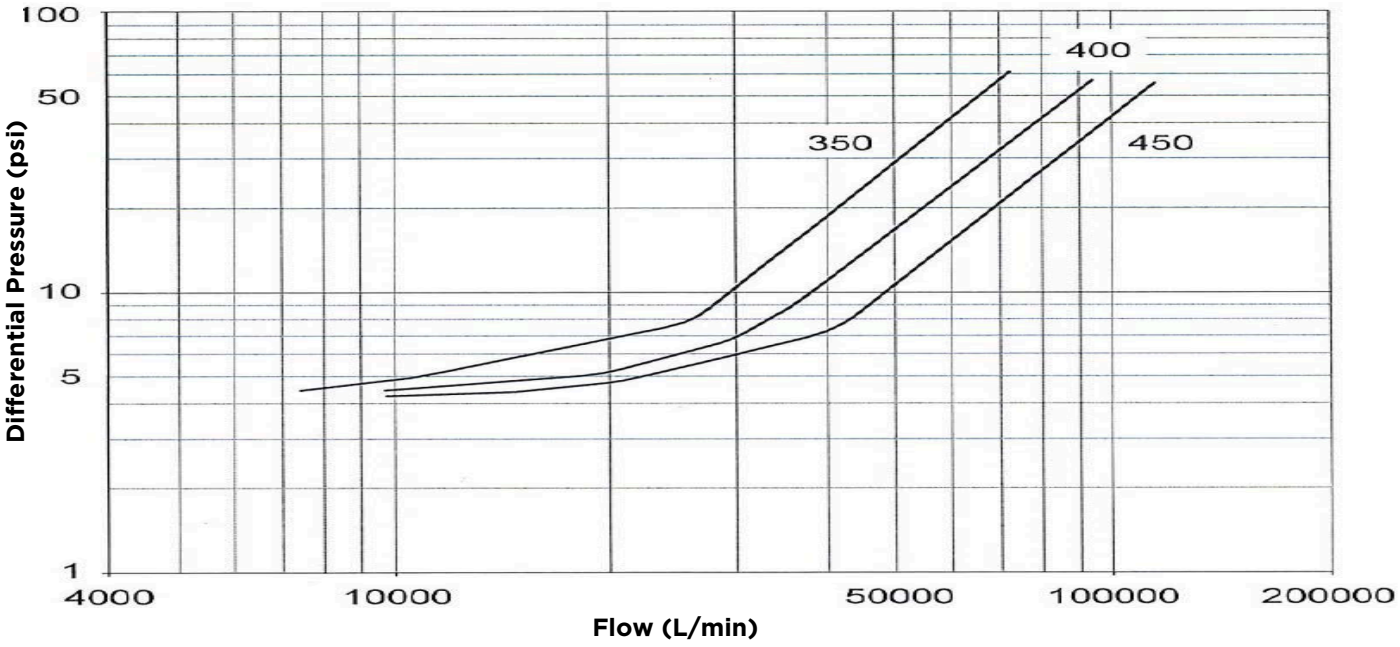


FLOW GRAPH - PREFILL / EXHAUST

Prefill (Flow A to B) Exhaust (Flow B to A)

Valve mounted horizontally, VPE CB type.
The values of flow and pressure are for an oil viscosity of 40 cst at 40°C

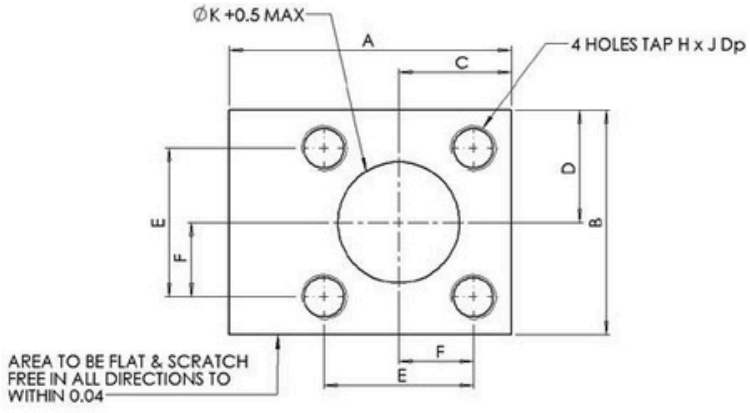
Size: 350, 400, 450



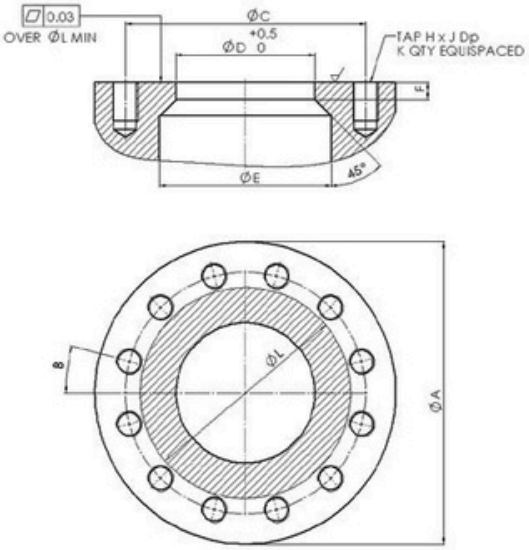


MOUNTING PATTERN - VALVE SIZES

Standard W. P. Version
For Valve Sizes: 40, 50, 65 and 90



Standard W. P. Version
For Valve Sizes: 130, 190, 250, 300, 350, 400 and 450



NOMINAL SIZE (MM)	40	50	65	90	130	190	250	300	350	350	400	450
NOMINAL PRESSURE	700	700	500	500	500	500	500	500	350	500	350	420
A	125	150	150	250	350	490	610	700	780	790	895	980
B	102	120	154	250	15°	15°	11.25°	11.25°	10°	7.5°	10°	9°
C	50	60	70	125	280	400	510	585	670	700	765	850
D	51	60	77	125	162	240	285	362	430	430	490	550
E	66.6	79.4	101.6	152.4	200	270	345	440	520	520	595	675
F	33.3	39.7	50.8	76.2	20	16	20	38	40	40	50	50
H	M20	M24	M24	M48	M30	M45	M48	M56	M56	M48	M64	M64
J	35	36	36	75	45	70	75	85	85	75	100	100
K	50.1	64.6	78.7	128.6	12	12	16	16	18	24	18	20
L	-	-	-	-	245	355	460	525	785	650	900	785



PREFERRED VALVE CODES - PART NUMBERS

SIZE	W.P.	CODE
40	700 BARS	VPECB40B-70AMBHKNMB*
50	700 BARS	VPECB50B-70AMBHKNMB*
65	500 BARS	VPECB65B-50ANBHKNMB*
90	500 BARS	VPECB90B-50ANBHKNMB*
130	500 BARS	VPECB130B-50ANBHKNMB*
190	500 BARS	VPECB190B-50ANBHKNMB*
250	500 BARS	VPECB250B-50ANBHKNMB*
300	500 BARS	VPECB300B-50ANBHKNMB*
350	350 BARS	VPECB350B-35ANBHKNMB*
400	350 BARS	VPECB400B-35ANBHKNMB*
450	350 BARS	VPECB450B-35ANBHKNMB*

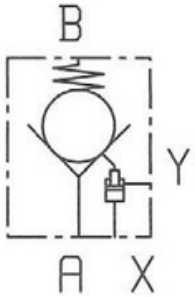
VALVE SYMBOLS

WITHOUT SWITCH

'VPE' VALVE TYPE
Sizes 40, 50, 65, 90, 130, 190, 250 and 300



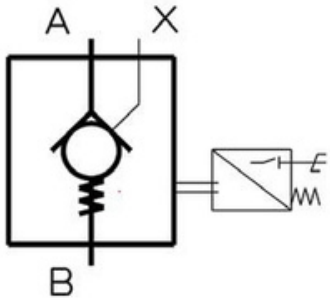
'VPE' VALVE TYPE
Sizes 350, 400 and 450

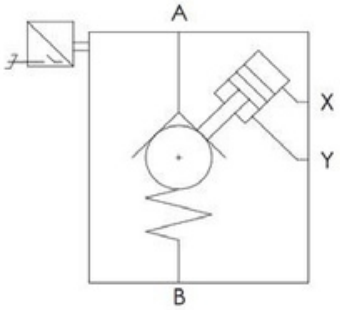


'VPP' VALVE TYPE
All sizes



WITH SWITCH







INSTALLATION DIMENSIONS - SEE PAGE 13 - 20 FOR DRAWINGS

Installation Dimensions Versions Standard Range:

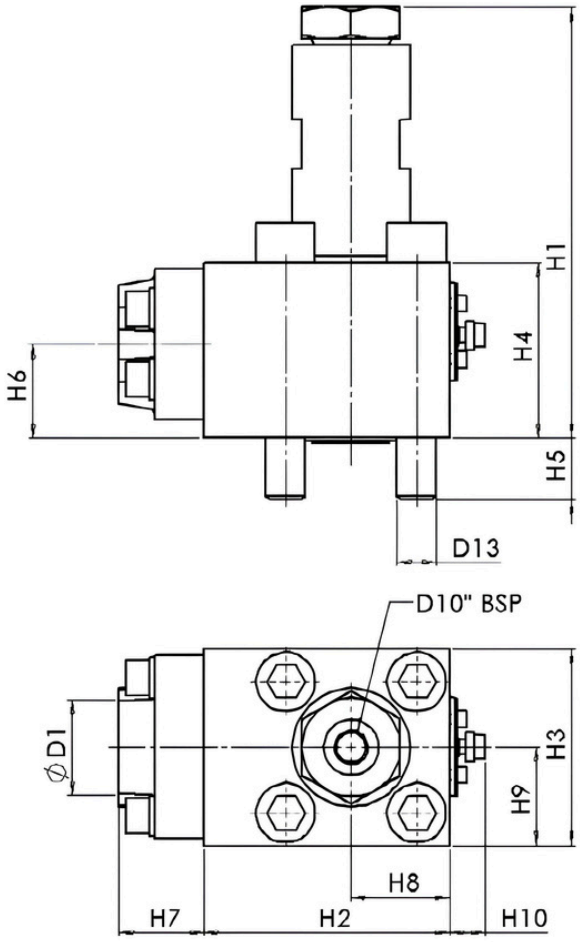
ND	40	50	65	90	130	190	250	300	350	350	400	450
MWP	700	700	500	500	500	500	500	500	350	500	350	420
D1	48.3	60.3	76.2	114.3	350	490	610	700	780	790	895	980
D2	-	-	-	-	280	400	510	585	670	700	765	850
D3	-	-	-	-	243	350	455	520	555	-	635	715
D4	-	-	-	-	162	240	285	362	430	430	490	550
D5	-	-	-	-	194	273	324	407	480	480	540	610
D6	-	-	-	-	181	225	304	381	386	-	437	488
D7	-	-	-	-	268	320	378	490	490	-	550	610
D8	-	-	-	-	340	405	460	580	580	-	640	715
D9	-	-	-	-	295	355	410	525	525	-	585	650
D10	3/8" BSP	3/8" BSP	3/8" BSP	1/2" BSP	1/2" BSP	1/2" BSP	3/4" BSP	3/4" BSP	25	25	25	32
D11	-	-	-	-	22	26	26	30	25	25	32	45
D12	-	-	-	-	185	220	240	260	260	126	285	310
D13	-	-	-	-	33	48	52	60	61	52	70	70
D14	-	-	-	-	-	-	-	-	30	-	30	33
A1	-	-	-	-	15°	15°	11.25°	11.25°	10°	7.5°	10°	9°
A2	-	-	-	-	15°	15°	15°	11.25°	11.25°	-	9°	9°
H1	219	230	259	300	503	658	750	903	1140	1427	1260	1400
H2	125	150	150	250	106	134	195	235	220	*	255	300
H3	100	120	154	250	48	50	75	95	150	195	175	210
H4	89	100	130	185	22	16	20	38	35	35	40	40
H5	31	30	25	75	283	375	485	580	560	-	630	690
H6	48	57	76	100	85	92	127	161	193	193	220	250
H7	43	45	50	50	45	42	52	81	87	87	100	105
H8	50	60	70	125	188	295	345	470	586	-	659	783
H9	50	60	77	125	-	-	-	-	-	1108	-	-
H10	18	-	-	65	493	649	750	895	-	-	-	-
H11	-	-	-	-	85	110	130	130	-	-	-	-
H12	-	-	-	-	463	614	705	850	-	-	-	-
L1	-	-	-	-	230	293	375	405	480	-	540	610
L2	-	-	-	-	26	29	32	38	38	-	42	46
L3	-	-	-	-	3	3	4	4	4	-	4	4
N1	-	-	-	-	12	12	16	16	18	24	18	20
N2	-	-	-	-	12	12	12	16	16	-	20	20

*** Consult factory for 3D models**



INSTALLATION DIMENSIONS

Installation Dimensions Versions CB and CP Standard Range
For Valve Sizes: 40, 50, 65 and 90

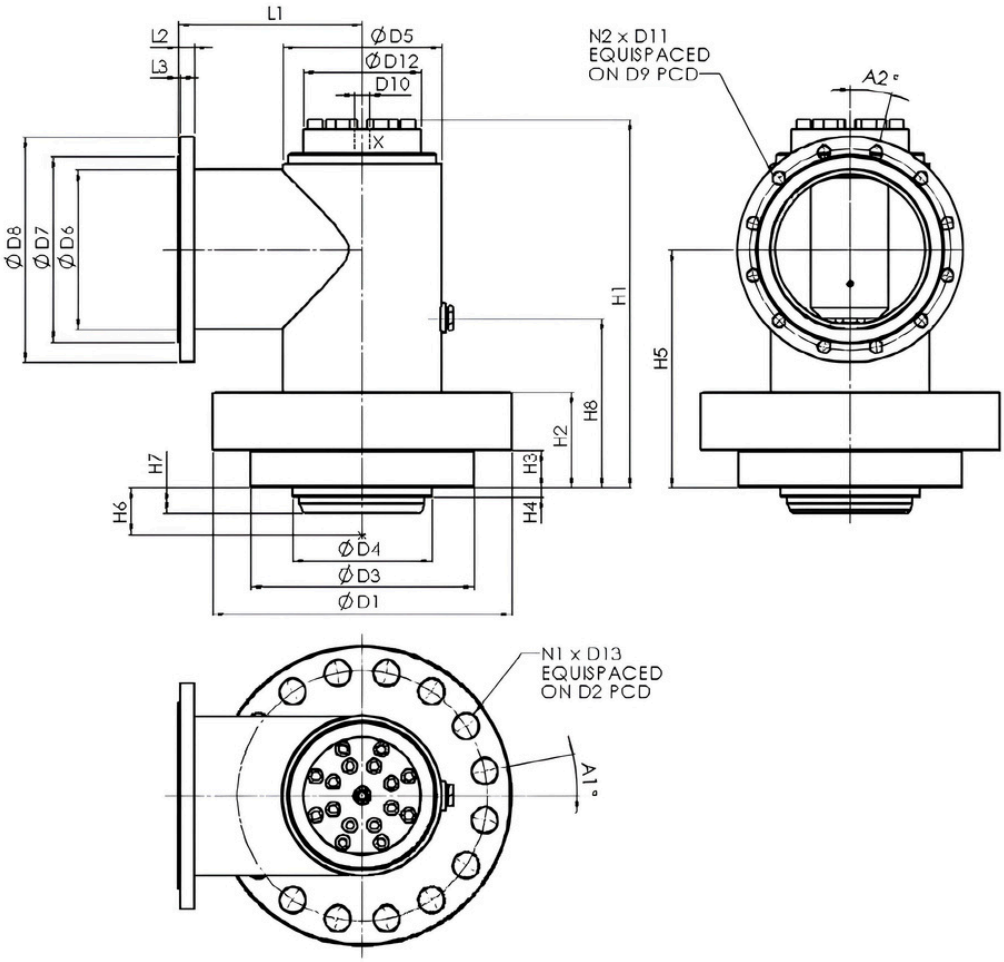




INSTALLATION DIMENSIONS

Installation Dimensions Versions CB and CP Standard Range

For Valve Sizes: 130, 190, 250 and 300

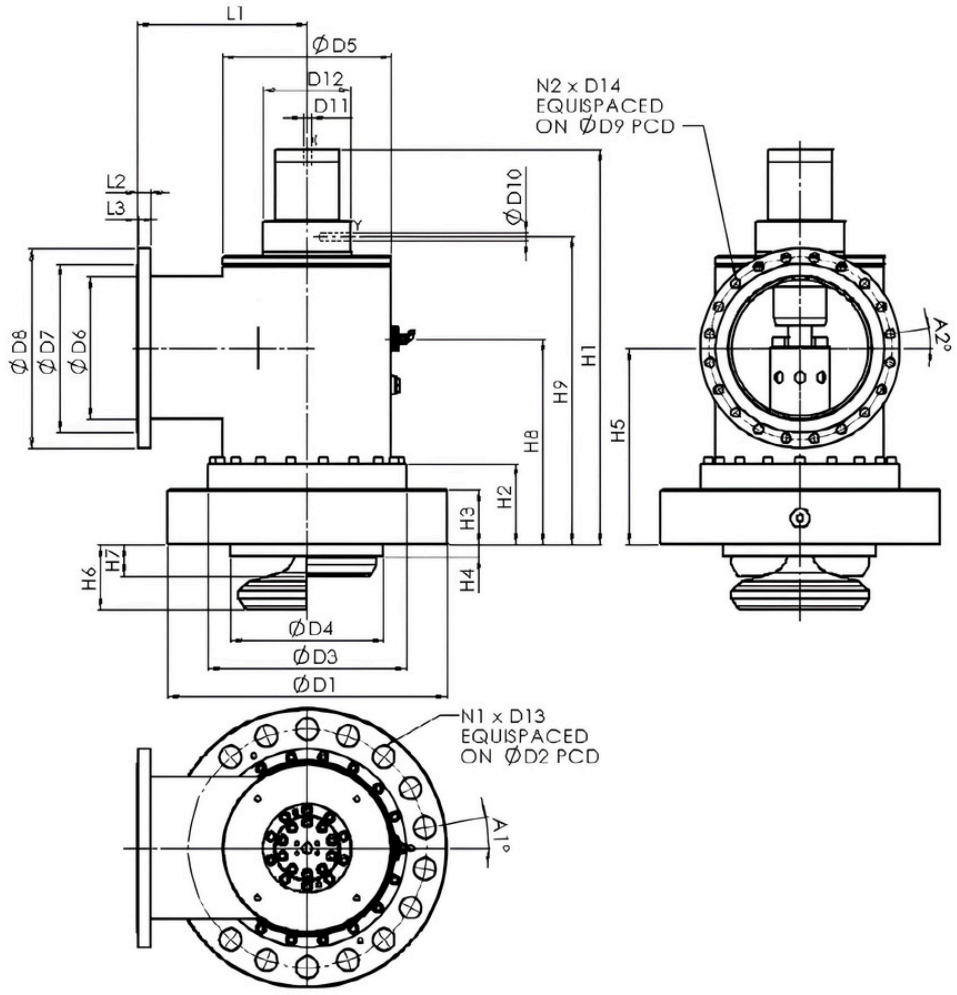




INSTALLATION DIMENSIONS

Installation Dimensions Versions CB and CP Standard Range

For Valve Sizes: 350, 400 and 450

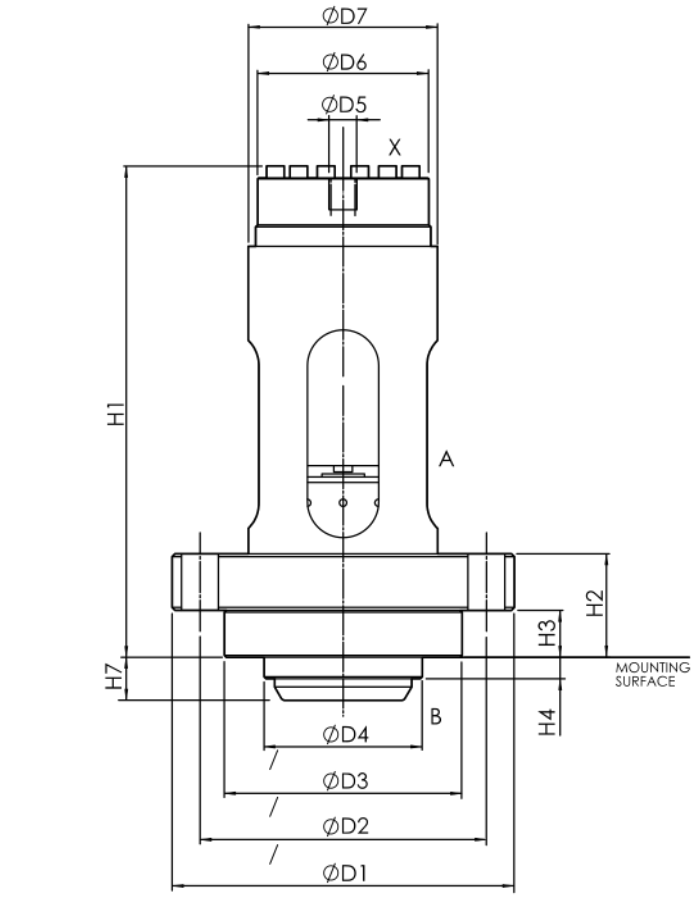


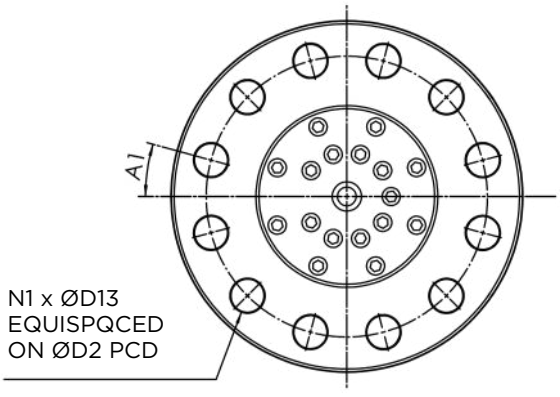


INSTALLATION DIMENSIONS

Installation Dimensions Version CT Standard Range

For Valve Sizes: 130, 190, 250, and 300



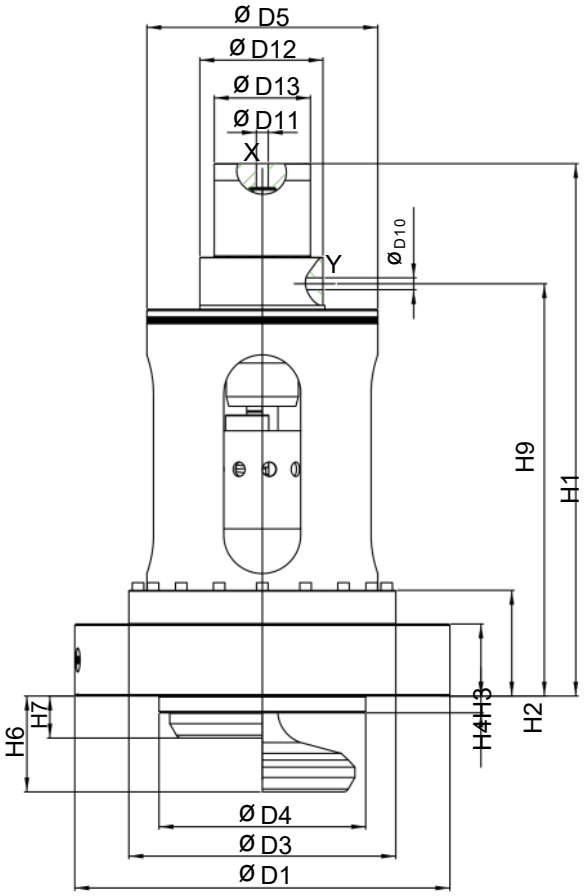


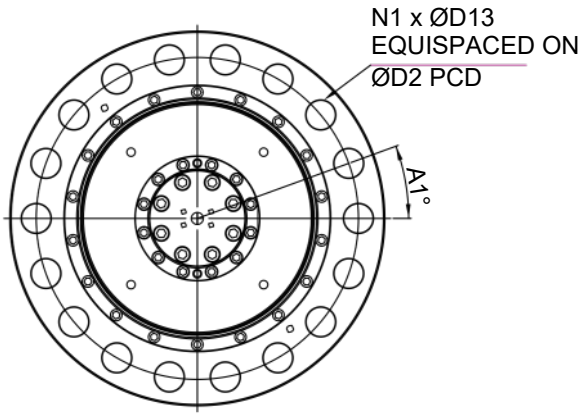


INSTALLATION DIMENSIONS

Installation Dimensions Version CT Standard Range

For Valve Sizes: 350, 400, and 450

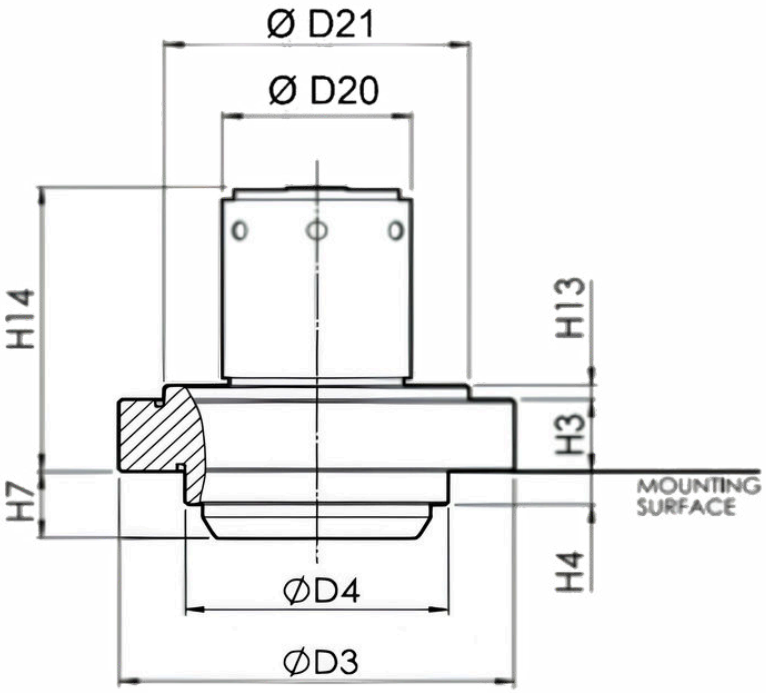






INSTALLATION DIMENSIONS

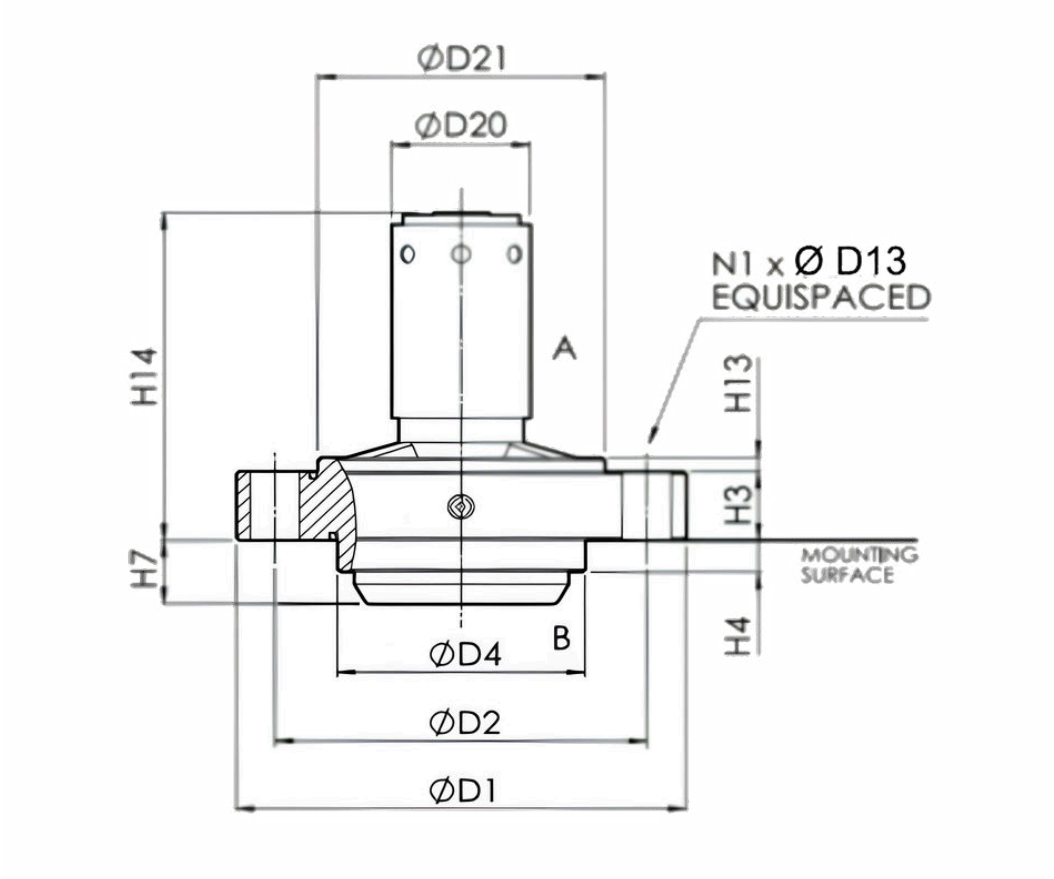
Installation Dimensions Version CC Standard Range
For Valve Sizes: 130, 190, 250, and 300





INSTALLATION DIMENSIONS

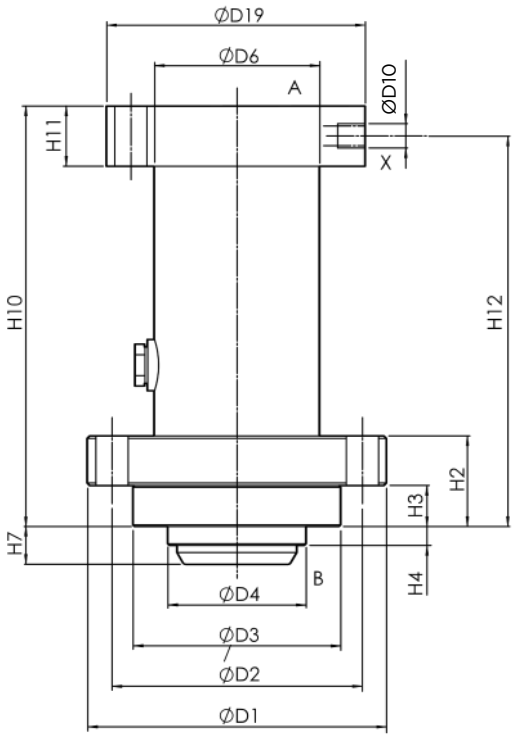
Installation Dimensions Version CC Standard Range
For Valve Sizes: 350, 400, and 450

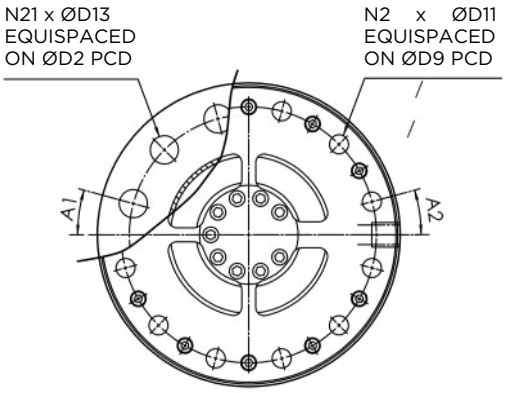




INSTALLATION DIMENSIONS

Installation Dimensions Version CL Standard Range
For Valve Sizes: 130, 190, 250, and 300





Installation Dimensions Version CL Standard Range
For Valve Sizes: 350, 400, and 450

Consult Factory



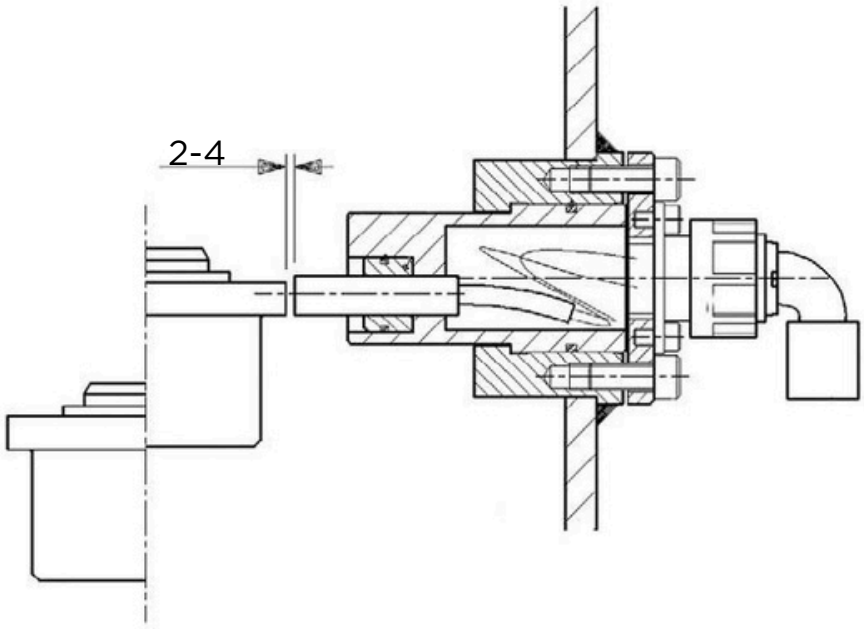
WEIGHT: STANDARD VERSION

SIZE	CONFIGURATION	VALVE WEIGHT (KG)
40	CB	9
50	CB	16
65	CB	33.5
90	CB	58
130	CC	23
	CT	90
	CL	115
	CB/CP	125
190	CC	45
	CT	205
	CL	225
	CB/CP	235
250	CC	90
	CT	365
	CL	410
	CB/CP	445
300	CC	294
	CT	770
	CL	790
	CB/CP	825
350	CC	540
	CT	800
	CL	836
	CB/CP	880
400	CC	815
	CT	1190
	CL	1215
	CB/CP	1278
450	CC	1164
	CT	1750
	CL	1790
	CB/CP	1885



PROXIMITY SWITCH WIRING

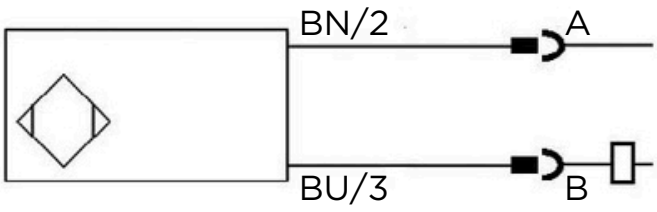
The proximity switch is set to the poppet closed position, it is a NO contact.



DETAILS OF PROXIMITY SWITCH
(OPTIONAL)

WIRING SCHEME

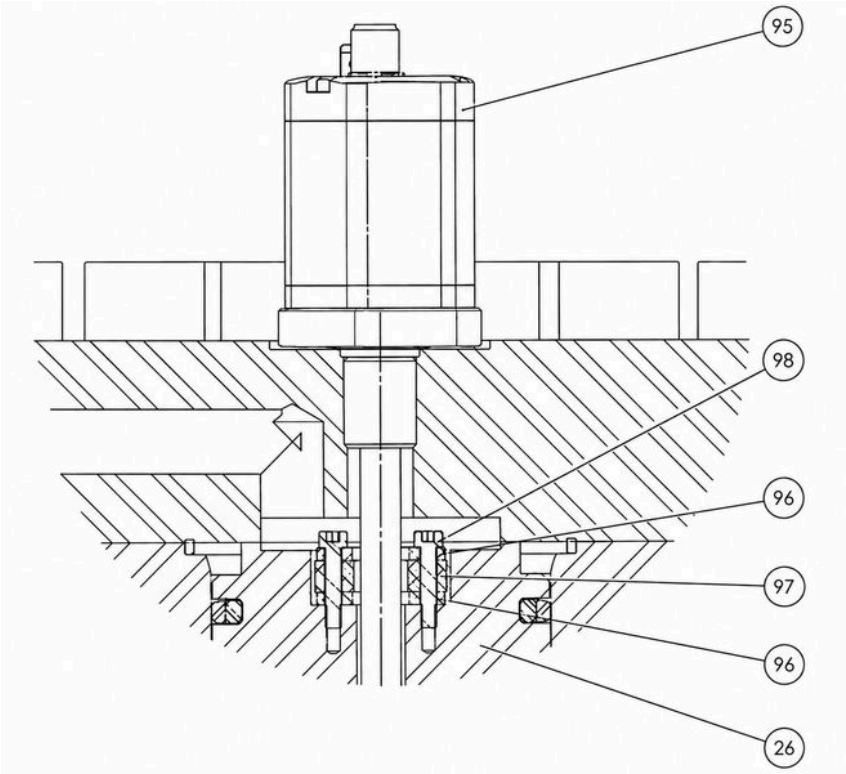
RATED SUPPLY VOLTAGE
24 TO 240V AC
OR 24 TO 210V DC





POSITION TRANSDUCER

In case of the option of the position transducer, the sensor will be located on the top of the prefill valve threaded to the cover plate and mounted inside the operating piston.



Wiring of the position transducer.

D84		
Signal + power supply		
M12 male connector (A-coded)	**Pin**	**Function**
 View on sensor	**1**	**Clock (+)**
	2	**Clock (-)**
	3	**Data (+)**
	4	**Data (-)**
	5	**Not connected**
	6	**Not connected**
	7	**+12...30 VDC (±20 %)**
	8	**DC Ground (0 V)**



SPECIAL DESIGNS

Please consult factory for any special needs:

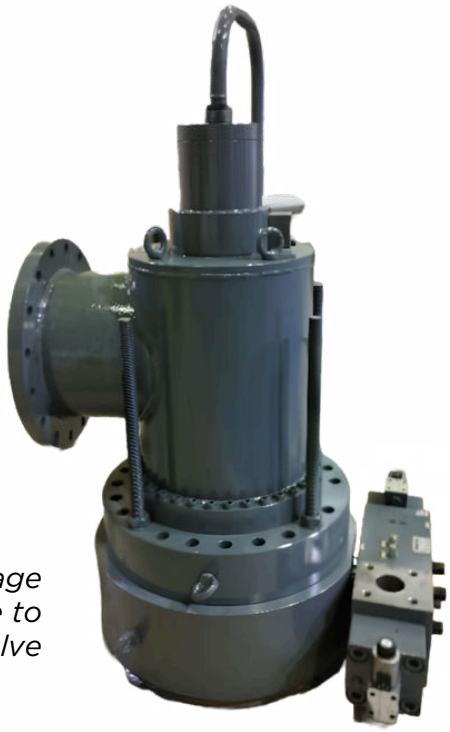
- Specific mechanical arrangement
- Specific mounting pattern
- Specific fluid of fluid conditions
- Additional monitoring need (Position transducer, etc.)
- Any other needs



Prefill valve for pure water

VINTAGE REPLACEMENT / CONVERSION KITS

Oilgear studies all kinds of replacement and conversion kits of existing prefill valves (Oilgear and vintage brand / models)



Conversion kit from a vintage Oilgear VSM prefill valve to a new VPE prefill valve

NOTES

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The Oilgear Company

Global Headquarters
1424 International Dr.
Traverse City, MI 49686 USA
(231) 929-1660
ussales@oilgear.com
www.oilgear.com

Fremont, Nebraska

905 S Downing St.
Fremont, NE 68025 USA
(402) 727-9700
ussales@oilgear.com

Mexico

Calle Argentina 3913
Monterrey, 64930
Mexico

United Kingdom

37 Burley Road
Leeds, LS3 1JT
United Kingdom

South Korea

167-3 Techno 2-ro, Yuseong-gu
Daejeon City, 34025
South Korea

China

3rd Floor, Bldg. A, No.3500
Xiupu Road, Shanghai
China

France

5, Allée des Frères Montgolfier
77183 Croissy-Beaubourg
France

Germany

Im Gotthelf 8
65795 Hattersheim
Germany

Spain

Entidad Zikuñaga
62, 20120, Hernani
Spain

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