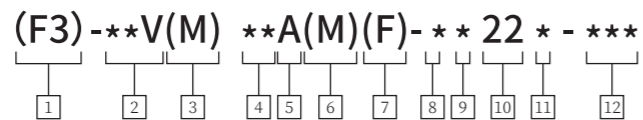


V/VQ Series Single Vane Pumps Maximum pressure 210 bar

Single-Stage Pump Model Designation System



1 F3 - Fluororubber Seals If omission is not required	4 Geometric displacement Rated Capacity (USgpm) at 1200 rpm and 6.9 bar (100 psi)	7 Installation Method Omitted — Flange Installation F - Tripod Mounting
2 Series Description 20V — 7 to 45 cm ³ /r (0.43 to 2.78 in ³ /r) 25V — 33 to 67 cm ³ /r (2.0 to 4.1 in ³ /r) 35V — 81 to 121 cm ³ /r (4.9 to 7.4 in ³ /r) 45V — 138 to 193 cm ³ /r (8.4 to 11.6 in ³ /r)	Base Code cm ³ /r in ³ /r Specifications (USgpm) 20V 2 7.5 0.43 5 16.7 1.10 8 26.2 1.67 9 30.0 1.85 11 35.0 2.22 12 37.9 2.47 14 44.2 2.78 ** ** **	8 Shaft Extension Standard Register and Shaft Extension Model Parallel Key Heavy-Duty Parallel Key Spline 20V 1 not applicable 151 20V to 45V 1 86 11
3 Stop Description Omitted — Standard Mounting Flange S — SAE (per ISO 3019/1; SAE J744) (Not applicable to 20V pumps) M — Metric (per ISO 3019/2, Code 100A2HW) (Not applicable to 20V pumps)	25V 10 32.5 2.01 12 38.3 2.47 14 43.3 2.78 17 52.5 3.39 21 65.0 4.13 25 78.6 4.94 ** ** ** 35V 21 66.7 4.13 25 79.2 4.94 30 95.0 5.91 35 109 6.83 38 118 7.37 ** ** ** 45V 42 134 8.41 45 147 8.95 50 156 9.85 60 189 11.75 ** ** **	"S" SAE Flange and "M" Metric ISO Stopper Shaft Extension 9 Oil Outlet Position (Viewed from the cover end of the pump) A — Opposite the inlet port B — 90° counter-clockwise from the inlet port C — On the same side as the inlet port D — 90° clockwise from the inlet port
5 Oil Port Connection A - SAE 4-Bolt Flange	6 Oil Port Connection Variants Omitted — Imperial Port Connections (4-Bolt Flange) M — Metric Port Connection (4-Bolt Flange — Not applicable to 20V pumps)	10 Design Code 11 Rotation Direction (Viewed from the pump shaft end) L — Counter-clockwise R — Clockwise
	12 Special Suffixes 167-2 — Bolt, 5.0 Dia. Pilot (25V Only — Not applicable to VS or VM models)	

V/VQ Series Single Vane Pumps Maximum pressure 210 bar

Maximum Operating Pressure of V/VQ Series Single Pumps

Model	Rated Capacity (cm ³ /r)	▲ Use anti-wear hydraulic oil or phosphate esters.		Use water-glycol fluid.		Use a water-in-oil emulsion.		Min Rotational Speed (r/min)							
		Max Operating Pressure (bar)	Max Rotational Speed (r/min)	Max Operating Pressure (bar)	Max Rotational Speed (r/min)	Max Operating Pressure (bar)	Max Rotational Speed (r/min)								
20V/VQ	2	7.5	138	138	1500	138	1200	600							
	3	10.2													
	4	12.8													
	5	16.7	207	1800	157	1500	138								
	6	19.2													
	7	22.9													
	8	26.2													
	10	31.0													
	11	35.0													
	12	37.9	157	138	1500	138	1200								
	14	44.2	138												
25V/VQ	10	32.5	172	1800	157	1500	138	1200							
	12	38.3													
	14	43.3													
	15	46.7													
	17	52.5													
	19	59.2													
	21	65.0													
	25	78.6							138	138					
35V/VQ	17	53.3	172	1800	157	1500	138	1200							
	21	66.7													
	25	79.2													
	30	95.0													
	32	100													
	35	109													
	38	118													
	42	134							138	138					
	45V/VQ	30							96.0	172	1800	157	1500	138	1200
		35							109						
38		128													
42		134													
50		156													
57		181													
60		189													
66		210	138	138											
75	236	138	138												

● The code designation represents the rated capacity in USgpm at 1200 r/min and 6.9 bar.
▲ Marking: Permits instantaneous (spike) pressure exceeding the maximum operating pressure by up to 10% for a duration of 0.5 seconds or less.

V/VQ Series Single Vane Pumps Maximum pressure 210 bar

20V/VQ Flange-Mount Type
Spindle Number No. 1 Spindle with Parallel Key

No Mark: Metric Thread
U Mark: Imperial Thread

Oil Outlet $\phi 19.1$
Oil Inlet $\phi 38.1$

Metric: 4-M10xP1.5, Depth 18
Imperial: 4-3/8"-16UNC, Depth 18

Metric: 4-M12xP1.75, Depth 23
Imperial: 4-1/2"-13UNC, Depth 23

20V/VQ Foot-Mounted Type
Spindle Number No. 1 Spindle with Parallel Key

4-M12 Run through
4- $\phi 14$ Perforation
 $\phi 28$ HOLES / DEEP 1

For other dimensions, please refer to the flange-mount type.

20V/VQ Flange-Mount Type
Spindle Number No. 151 Splined Spindle

No Mark: Metric Thread
U Mark: Imperial Thread

Oil Inlet $\phi 38.1$
Oil Outlet $\phi 19.1$

Metric: 4-M10xP1.5, Depth 18
Imperial: 4-3/8"-16UNC, Depth 18

Metric: 4-M12xP1.75, Depth 23
Imperial: 4-1/2"-13UNC, Depth 23

In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

Modulus	D.P.16/32
Pressure Angle	30°
Number of teeth	13
Pitch Circle Diameter	$\phi 20.6375$
Max Diameter	$\phi 22.175^{+0}_{-0.025}$
Min diameter	$\phi 18.63^{+0}_{-0.25}$

V/VQ Series Single Vane Pumps Maximum pressure 210 bar

25V/VQ Flange-Mount Type
Spindle Number No. 1 Spindle with Parallel Key

No Mark: Metric Thread
U Mark: Imperial Thread

Oil Inlet $\phi 38.1$
Oil Outlet $\phi 25.4$

Metric: 4-M12xP1.75, Depth 24
Imperial: 4-1/2"-13UNC, Depth 24

Metric: 4-M10xP1.5, Depth 19
Imperial: 4-3/8"-16UNC, Depth 19

25V/VQ Flange-Mount Type
Spindle Number No. 86 Keyed Spindle

No Mark: Metric Thread
U Mark: Imperial Thread

Oil Inlet $\phi 38.1$
Oil Outlet $\phi 25.4$

Metric: 4-M12xP1.75, Depth 24
Imperial: 4-1/2"-13UNC, Depth 24

Metric: 4-M10xP1.5, Depth 19
Imperial: 4-3/8"-16UNC, Depth 19

25V/VQ Foot-Mounted Type
Spindle Number Spindles 1 & 86

25V/VQ Size Chart		
Spindle Type	A	B
Spindle 1	58.8	36.8
Spindle No. 86	78.1	52.1

4-M12 Run through
4- $\phi 14$ Perforation
 $\phi 28$ HOLES DEEP 1

V/VQ Series Single Vane Pumps

Maximum pressure 210 bar

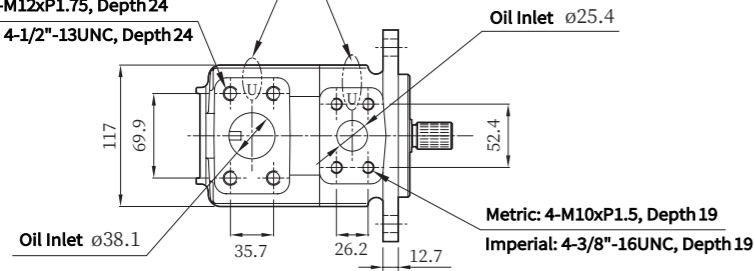
25V/VQ Flange-Mount Type

Spindle Number No. 11 Splined Spindle

No Mark: Metric Thread
U Mark: Imperial Thread

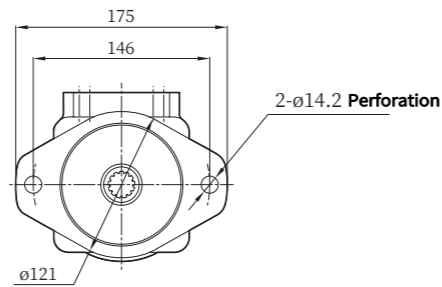
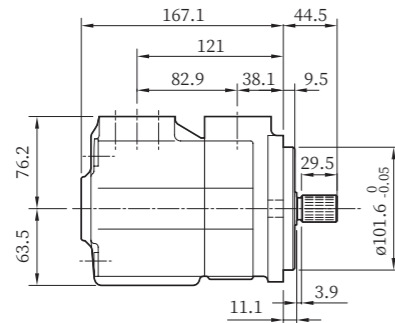
Metric: 4-M12xP1.75, Depth 24

Imperial: 4-1/2"-13UNC, Depth 24



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

Modulus	D.P.16/32
Pressure Angle	30°
Number of teeth	13
Pitch Circle Diameter	ø20.6375
Max Diameter	ø22.175 ⁺⁰ _{-0.025}
Min diameter	ø18.63 ⁺⁰ _{-0.25}



V/VQ Series Single Vane Pumps

Maximum pressure 210 bar

35V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key

No Mark: Metric Thread
U Mark: Imperial Thread

Oil Inlet ø50.8

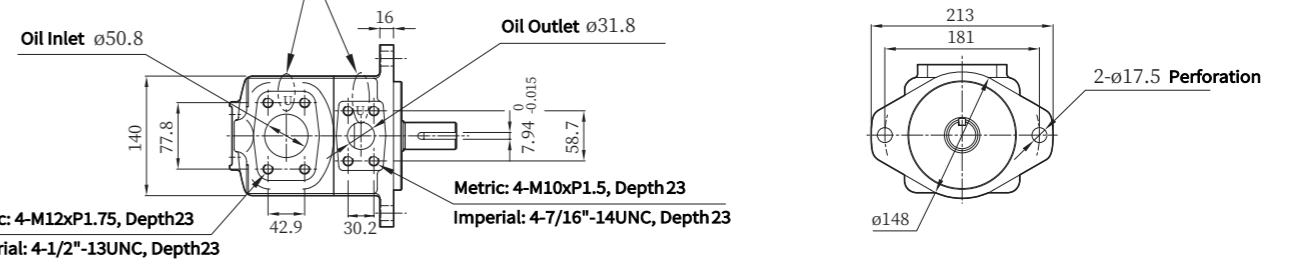
Oil Outlet ø31.8

Metric: 4-M12xP1.75, Depth 23

Imperial: 4-1/2"-13UNC, Depth 23

Metric: 4-M10xP1.5, Depth 23

Imperial: 4-7/16"-14UNC, Depth 23



35V/VQ Flange-Mount Type

Spindle Number No. 86 Keyed Spindle

No Mark: Metric Thread
U Mark: Imperial Thread

Oil Inlet ø50.8

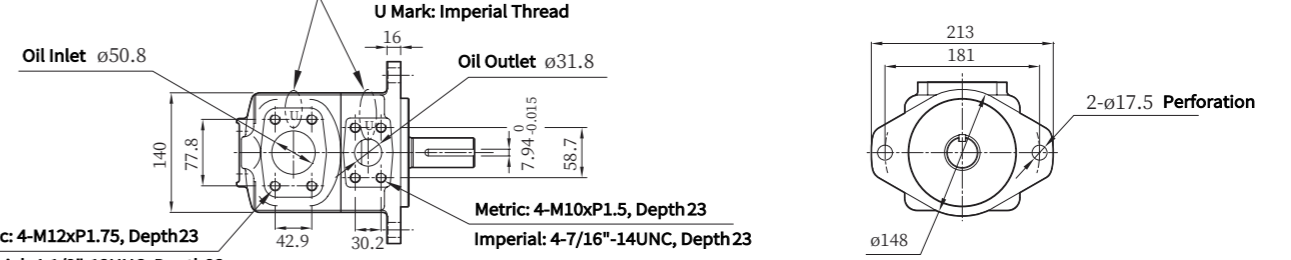
Oil Outlet ø31.8

Metric: 4-M12xP1.75, Depth 23

Imperial: 4-1/2"-13UNC, Depth 23

Metric: 4-M10xP1.5, Depth 23

Imperial: 4-7/16"-14UNC, Depth 23

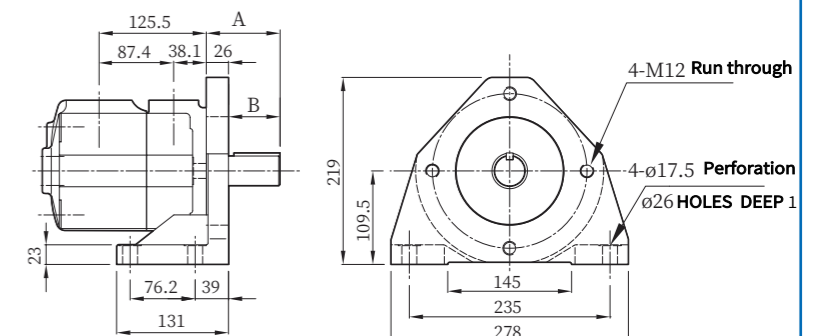


35V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86

35V/VQ Size Chart

Spindle Type	A	B
Spindle 1	73.6	47.6
Spindle No. 86	86.4	60.4

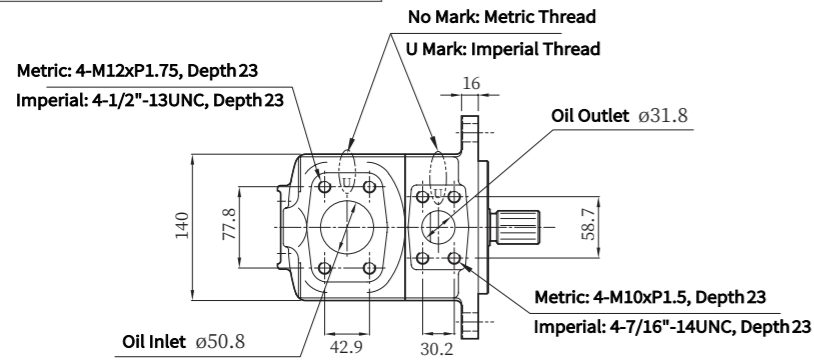


V/VQ Series Single Vane Pumps

Maximum pressure 210 bar

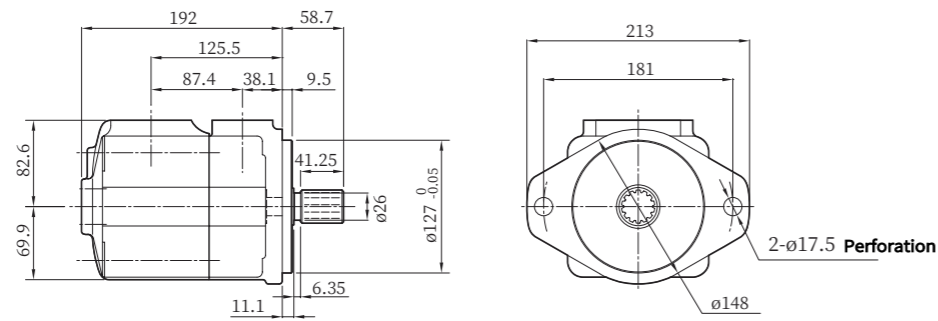
35V/VQ Flange-Mount Type

Spindle Number No. 11 Splined Spindle



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

Modulus	D.P.12/24
Pressure Angle	30°
Number of teeth	14
Pitch Circle Diameter	ø29.6333
Max Diameter	ø31.75 ⁺⁰ _{-0.025}
Min diameter	ø26.924 ⁺⁰ _{-0.25}

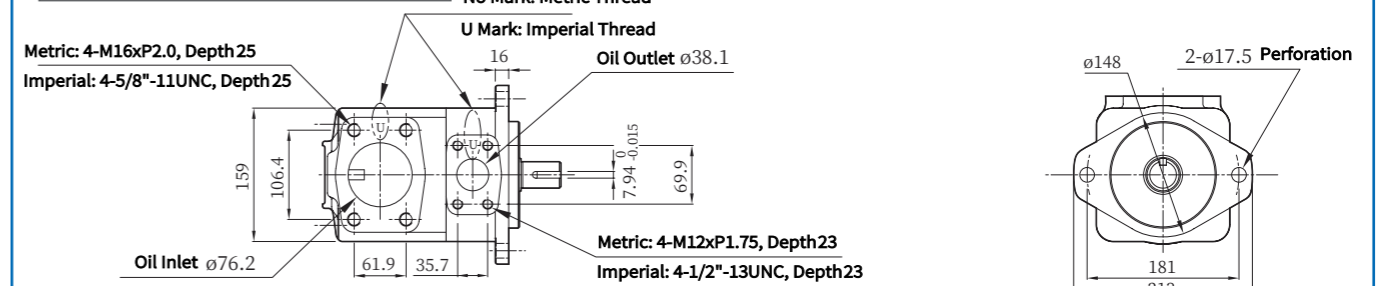


V/VQ Series Single Vane Pumps

Maximum pressure 210 bar

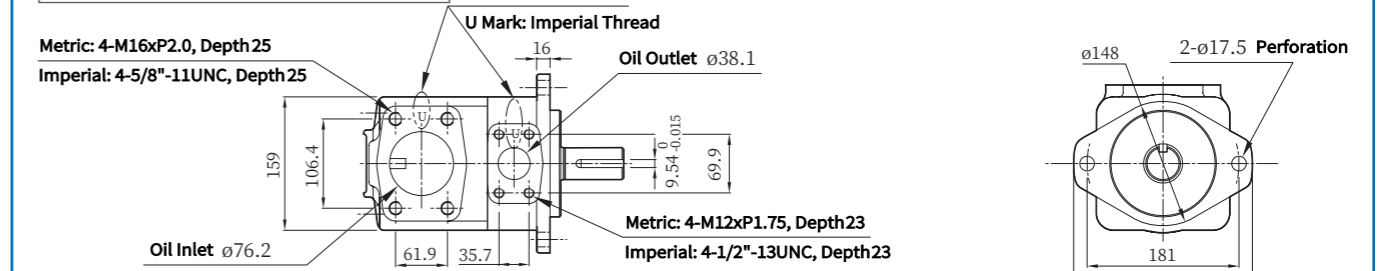
45V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key



45V/VQ Flange-Mount Type

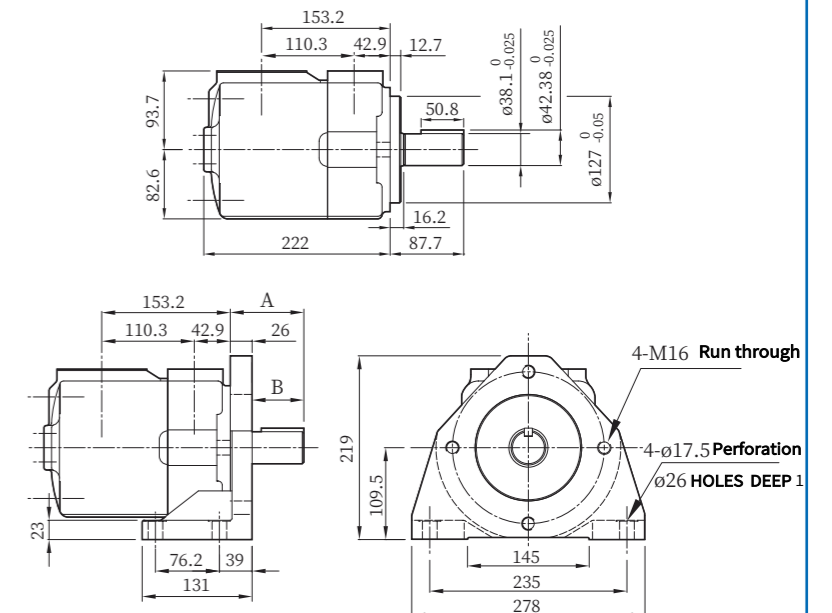
Spindle Number No. 86 Keyed Spindle



45V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86

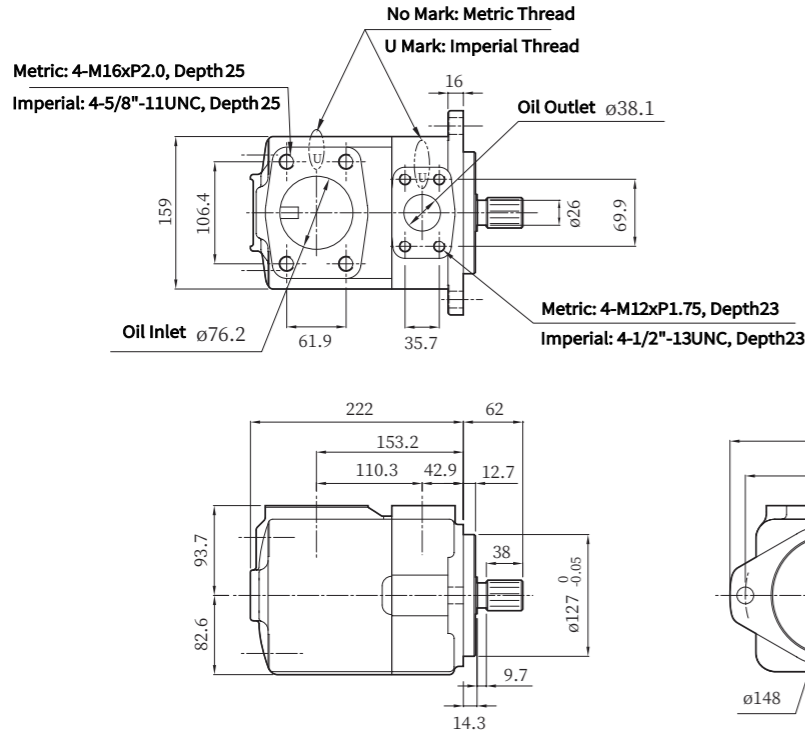
45V/VQ Size Chart		
Spindle Type	A	B
Spindle 1	62.3	36.3
Spindle No. 86	87.7	61.7



V/VQ Series Single Vane Pumps

Maximum pressure 210 bar

45V/VQ Flange-Mount Type
Spindle Number No. 11 Splined Spindle



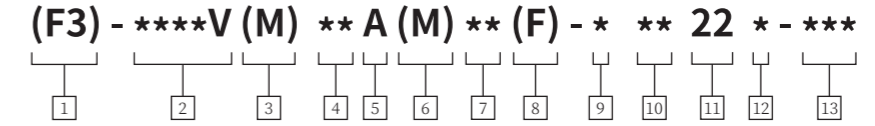
In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

Modulus	D.P.12/24
Pressure Angle	30°
Number of teeth	14
Pitch Circle Diameter	ø29.6333
Max Diameter	ø31.75 ⁺⁰ _{-0.025}
Min diameter	ø26.924 ⁺⁰ _{-0.25}

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

Dual Pump Model Numbering Convention



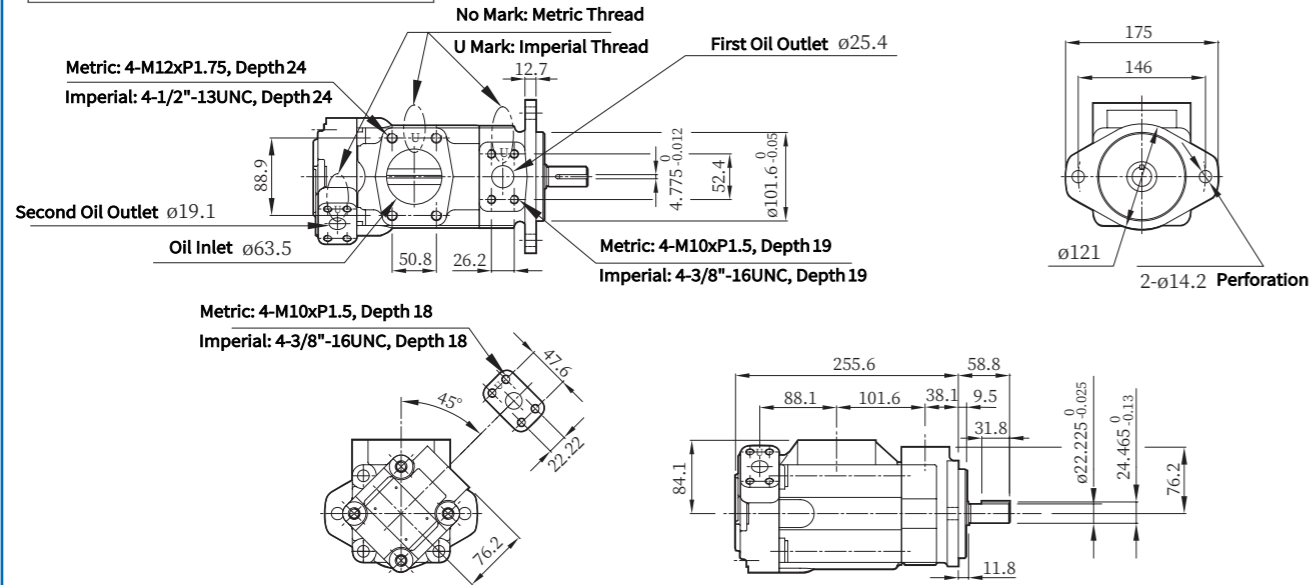
- 1 F3 - Fluororubber Seals
If omission is not required
- 2 Series Description
Displacement Model Shaft End End Cap End
2520V- 33 - 67 7 - 45
(2.0 - 4.1) (0.45 - 2.8)
2525V - 33 - 67 33 - 67
(2.0 - 4.1) (2.0 - 4.1)
3520V - 81 - 121 7 - 45
(4.9 - 7.4) (0.45 - 2.2)
3525V - 81 - 121 33 - 67
(4.9 - 7.4) (2.0 - 4.1)
4520V - 138 - 193 7 - 45
(8.4 - 11.8) (0.45 - 2.2)
4535V - 138 - 193 81 - 121
(8.4 - 11.8) (4.9 - 7.4)
- 3 Stop Description
Omitted — Standard Mounting Flange
S — SAE (per ISO 3019/1; SAE J744) (Not applicable to 20V pumps)
M — Metric (per ISO 3019/2, Code 100A2HW) (Not applicable to 20V pumps)
- 4 Geometric Displacement - Shaft-End Pump
Rated Capacity (USgpm) at 1200 rpm and 6.9 bar (100 psi)
Base Specifications Code (USgpm) cm³/r in³/r
25**V 10 32.5 2.0
12 38.3 2.5
14 43.3 2.8
17 52.5 3.4
21 65.0 4.1
** ** ** **
35**V 25 79.2 4.9
30 95.0 5.9
35 109 6.8
38 118 7.4
** *** **
45**V 42 134 8.4
45 147 9.0
50 156 9.9
60 189 11.8
** *** **
- 5 Oil Port Connection
A - SAE 4-Bolt Flange
- 6 Oil Port Connection Variants
Omitted — Imperial Port Connections (4-Bolt Flange)
M - Metric Port Connection (4-Bolt Flange — Not applicable to 20V pumps)
- 7 Geometric Displacement - End-Cover Pump
Rated Capacity (USgpm) at 1200 rpm and 6.9 bar (100 psi)
Base Specifications Code (USgpm) cm³/r in³/r
**20V 2 7.5 0.43
5 16.7 1.1
8 26.2 1.7
9 30.0 1.9
11 35.0 2.2
12 37.9 2.5
14 44.2 2.8
** ** **
**25V 10 32.5 2.0
12 38.3 2.5
14 43.3 2.8
17 52.5 3.4
21 65.0 4.1
** *** **
**35V 25 79.2 4.9
30 95.0 5.9
35 109 6.8
38 118 7.4
** *** **
- 8 Installation Method
Omitted — Flange Installation
F - Tripod Mounting
- 9 Shaft Extension
Standard Register and Shaft Extension
Model Parallel Key Heavy-Duty Parallel Key Spline
25 V - 45 V 1 86 11
"S" SAE Flange and "M" Metric ISO Flange Shaft Extension
- 10 Oil Port Position
(Viewed from the cover end of the pump)
All Series (except 2525V and 4535V)
1st Outlet: Opposite the Inlet
AA - 2nd Outlet: 135° Counter-clockwise from the Inlet
AB - 2nd Outlet: 45° Counter-clockwise from the Inlet
AC - 2nd Outlet: 45° Clockwise from the Inlet
AD - 2nd Outlet: 135° Clockwise from the Inlet
1st Outlet: 90° Counter-clockwise from the Inlet
BA - 2nd Outlet: 135° Counter-clockwise from the Inlet
BB - 2nd Outlet: 45° Counter-clockwise from the Inlet
BC - 2nd Outlet: 45° Clockwise from the Inlet
BD - 2nd Outlet: 135° Clockwise from the Inlet
1st Outlet: On the Same Side as the Inlet
CA - 2nd Outlet: 135° Counter-clockwise from the Inlet
CB - 2nd Outlet: 45° Counter-clockwise from the Inlet
CC - 2nd Outlet: 45° Clockwise from the Inlet
CD - 2nd Outlet: 135° Clockwise from the Inlet
1st Outlet: 90° Clockwise from the Inlet
DA - 2nd Outlet: 135° Counter-clockwise from the Inlet
DB - 2nd Outlet: 45° Counter-clockwise from the Inlet
DC - 2nd Outlet: 45° Clockwise from the Inlet
DD - 2nd Outlet: 135° Clockwise from the Inlet
Series 2525V and 4535V
1st Outlet Opposite Inlet
AA - 2nd Outlet Opposite Inlet
AB - 2nd Outlet 90° Counter-clockwise from Inlet
AC - 2nd Outlet on Same Side as Inlet
AD - 2nd Outlet 90° Clockwise from Inlet
1st Outlet 90° Counter-clockwise from Inlet
BA - 2nd Outlet Opposite Inlet
BB - 2nd Outlet 90° Counter-clockwise from Inlet
BC - 2nd Outlet on Same Side as Inlet
BD - 2nd Outlet 90° Clockwise from Inlet
1st Outlet on Same Side as Inlet
CA - 2nd Outlet Opposite Inlet
CB - 2nd Outlet 90° Counter-clockwise from Inlet
CC - 2nd Outlet on Same Side as Inlet
CD - 2nd Outlet 90° Clockwise from Inlet
1st Outlet 90° Clockwise from Inlet
DA - 2nd Outlet Opposite Inlet
DB - 2nd Outlet 90° Counter-clockwise from Inlet
DC - 2nd Outlet on Same Side as Inlet
DD - 2nd Outlet 90° Clockwise from Inlet
- 11 Design Code
- 12 Rotation Direction
(Viewed from the pump shaft end)
L — Counter-clockwise
R — Clockwise
- 13 Special Suffixes
167-2 — Bolt, 5.0 Dia. Pilot
(25V Only — Not applicable to VS or VM models)

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

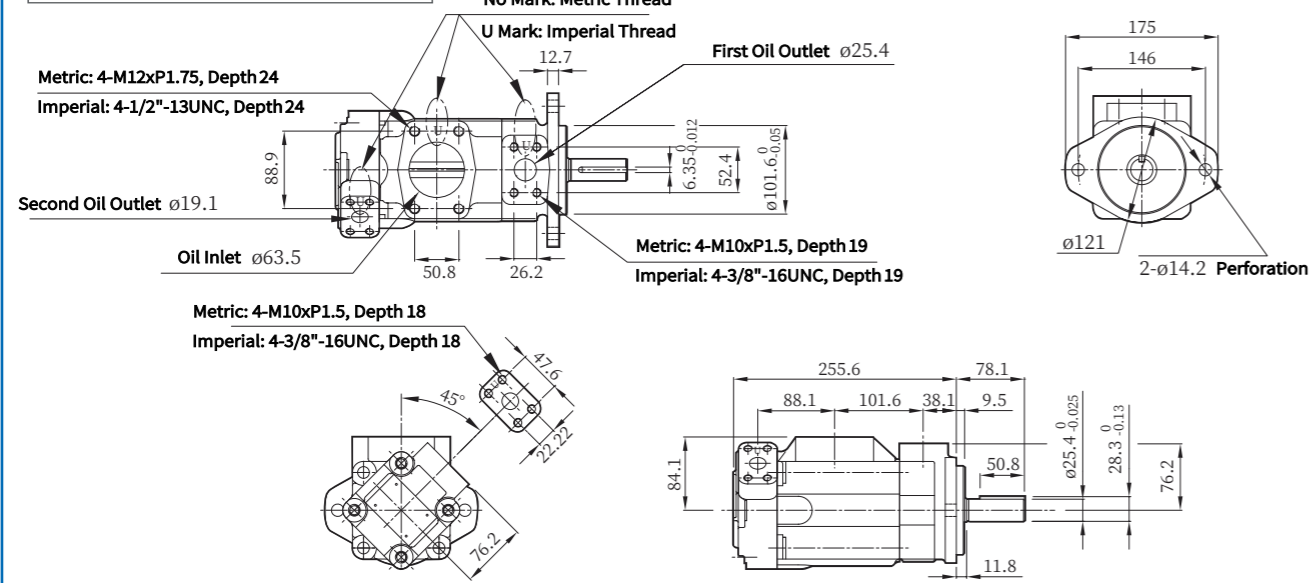
2520V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key



2520V/VQ Flange-Mount Type

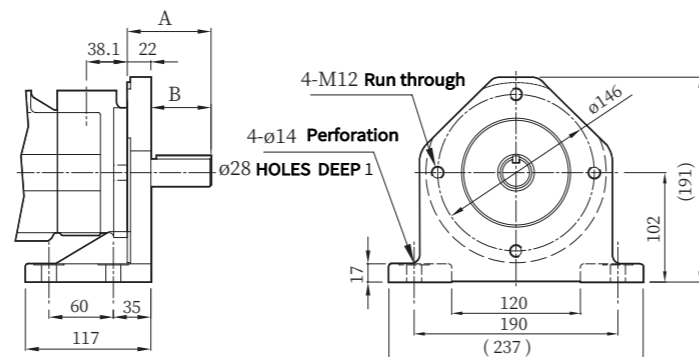
Spindle Number No. 86 Keyed Spindle



2520V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86

2520V/VQ Size Chart		
Spindle Type	A	B
Spindle 1	58.8	36.8
Spindle No. 86	78.1	56.1

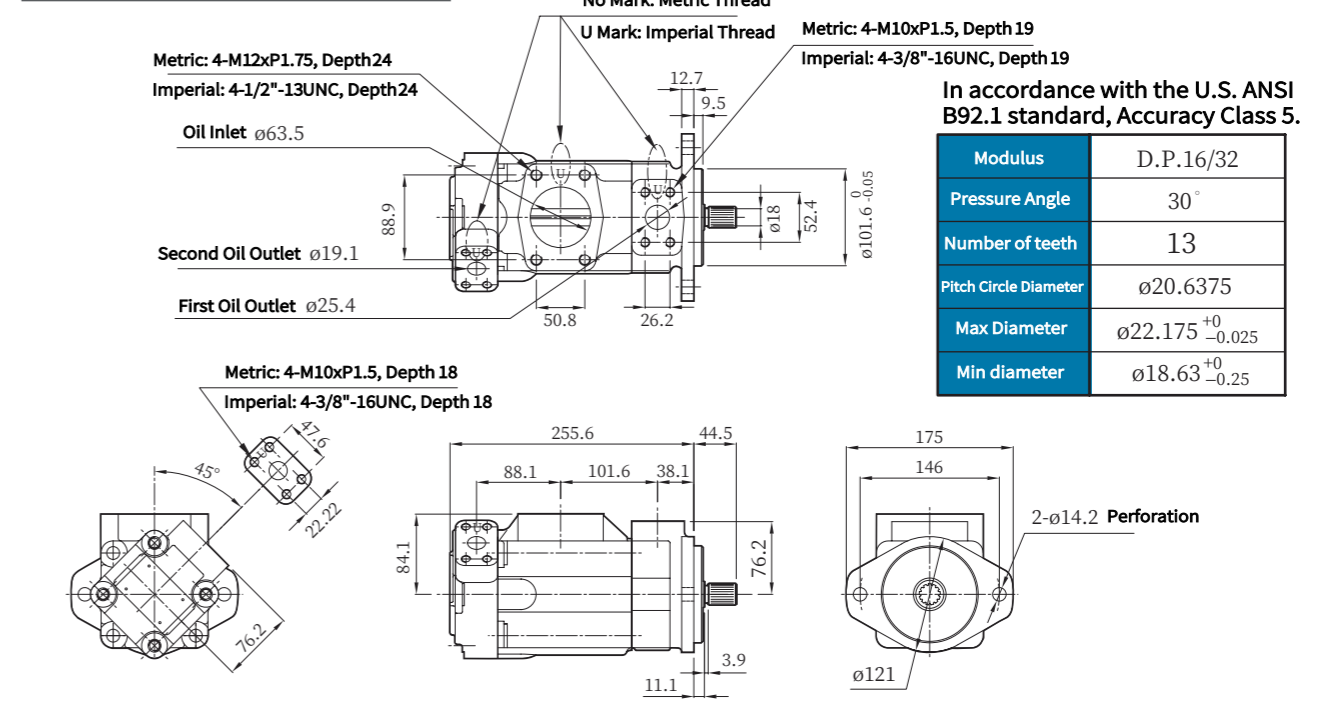


V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

2520V/VQ Flange-Mount Type

Spindle Number No. 11 Splined Spindle



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

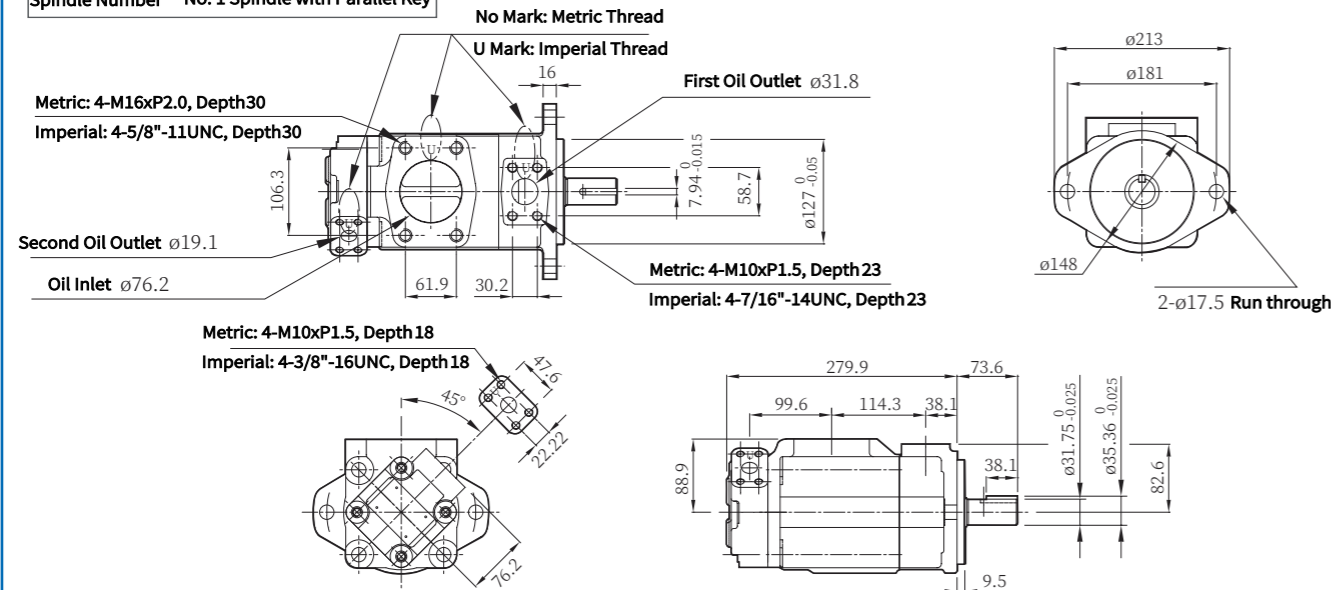
Modulus	D.P.16/32
Pressure Angle	30°
Number of teeth	13
Pitch Circle Diameter	$\phi 20.6375$
Max Diameter	$\phi 22.175^{+0}_{-0.025}$
Min diameter	$\phi 18.63^{+0}_{-0.25}$

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

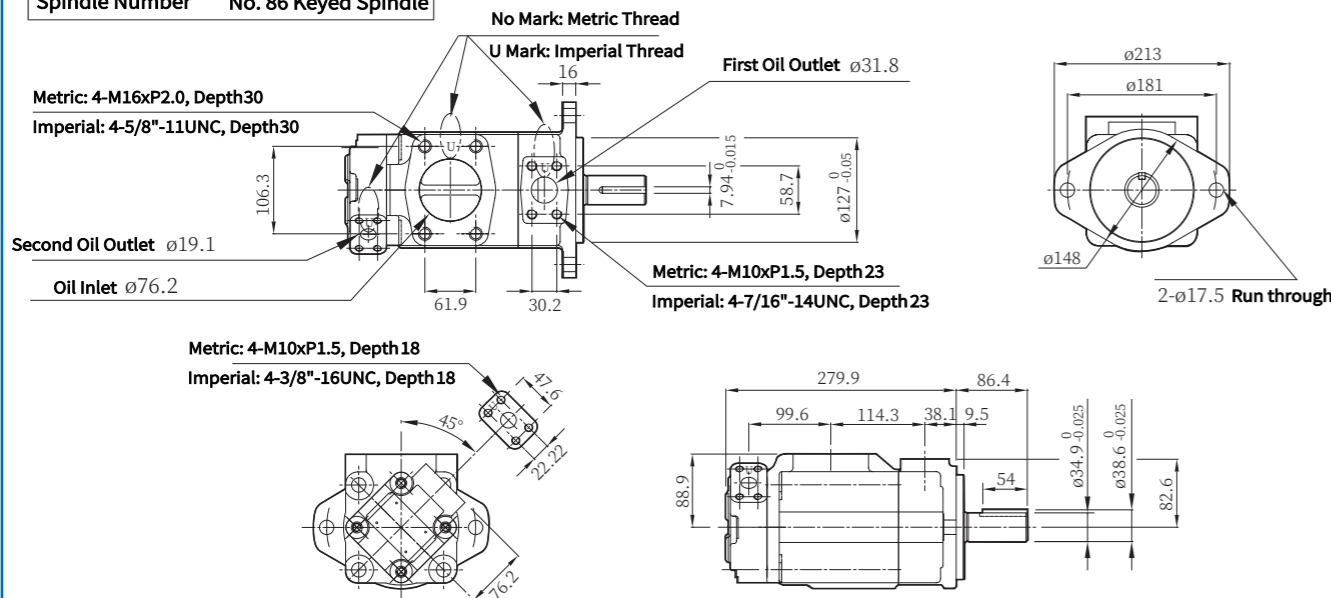
3520V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key



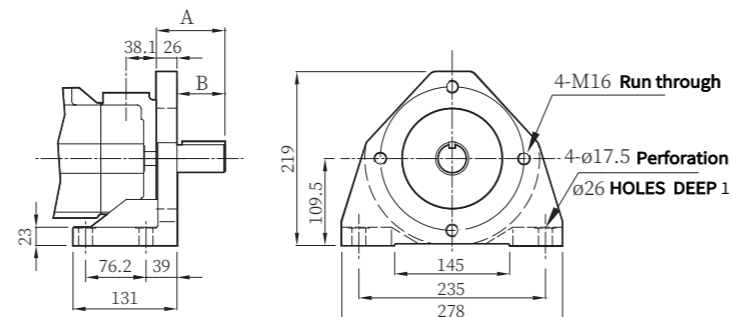
3520V/VQ Flange-Mount Type

Spindle Number No. 86 Keyed Spindle



3520V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86



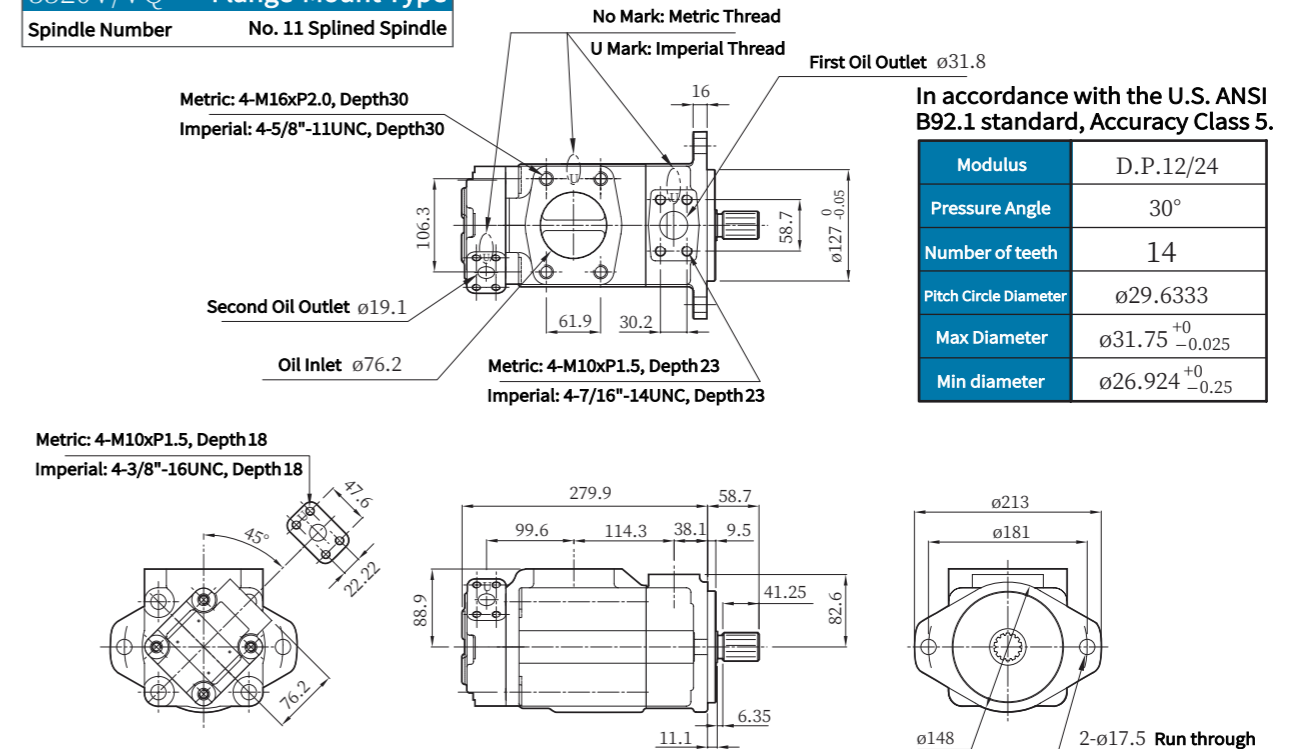
3520V/VQ Size Chart		
Spindle Type	A	B
Spindle 1	73.6	47.6
Spindle No. 86	86.4	60.4

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

3520V/VQ Flange-Mount Type

Spindle Number No. 11 Splined Spindle



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

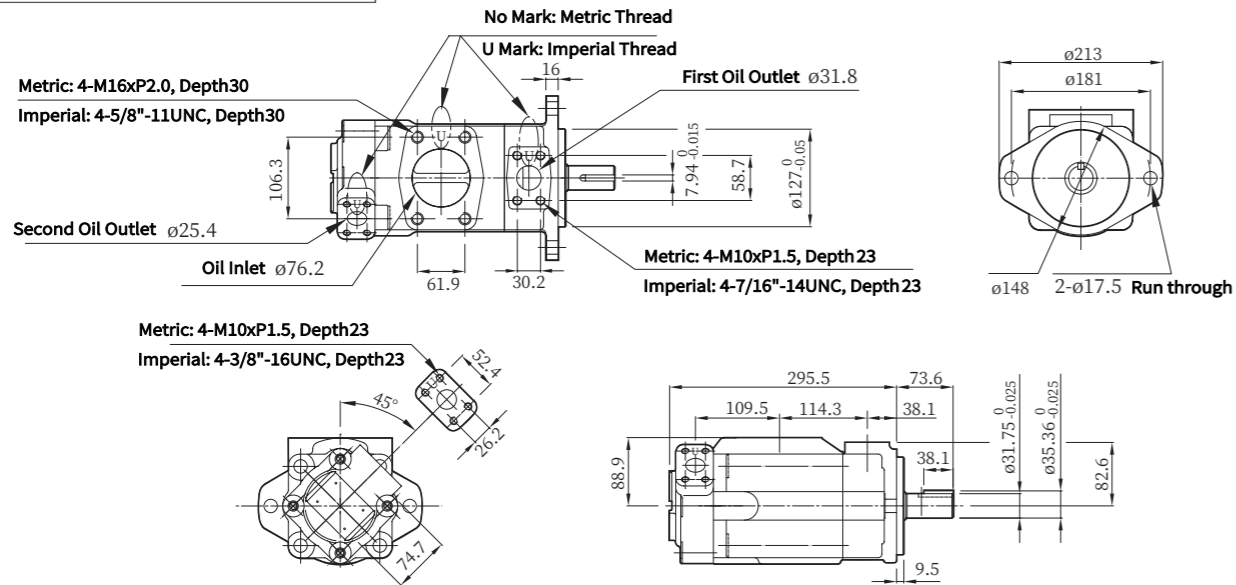
Modulus	D.P.12/24
Pressure Angle	30°
Number of teeth	14
Pitch Circle Diameter	ø29.6333
Max Diameter	ø31.75 ⁺⁰ _{-0.025}
Min diameter	ø26.924 ⁺⁰ _{-0.25}

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

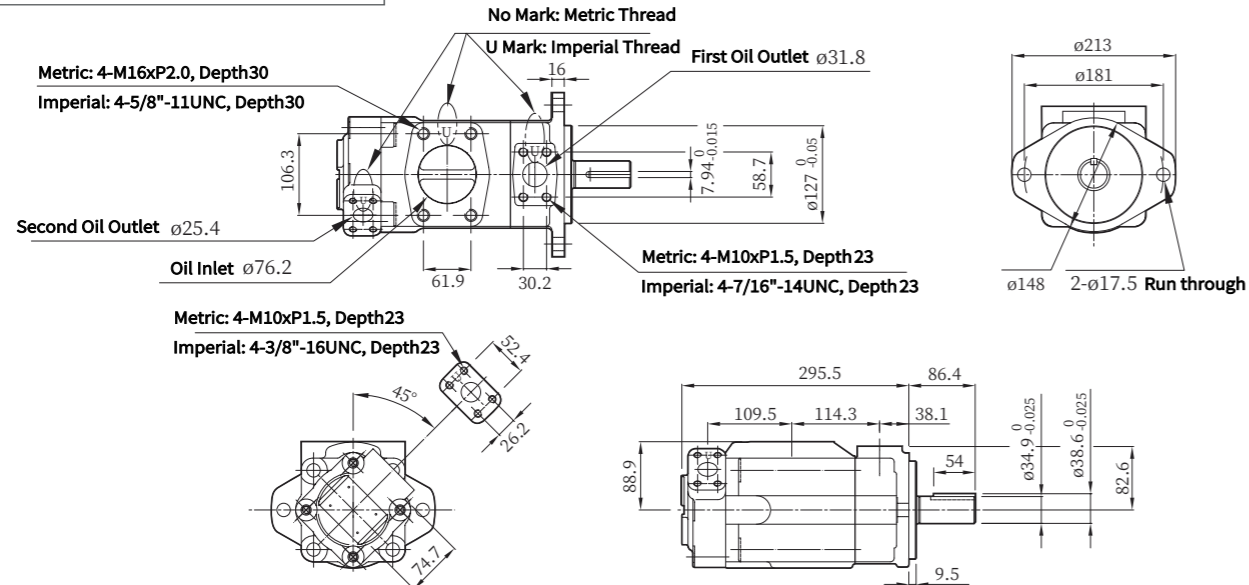
3525V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key



3525V/VQ Flange-Mount Type

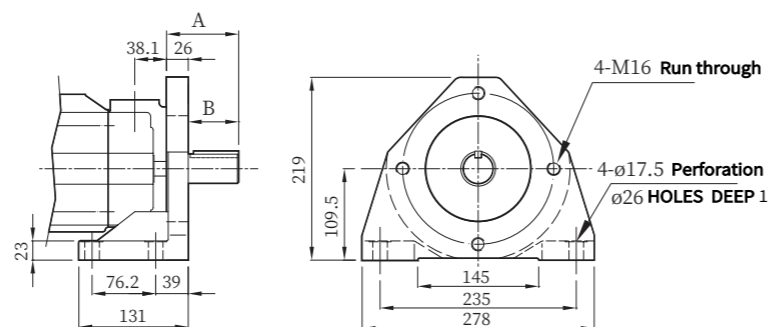
Spindle Number No. 86 Keyed Spindle



3525V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86

3525V/VQ Size Chart		
Spindle Type	A	B
Spindle 1	73.6	47.6
Spindle No. 86	86.4	60.4

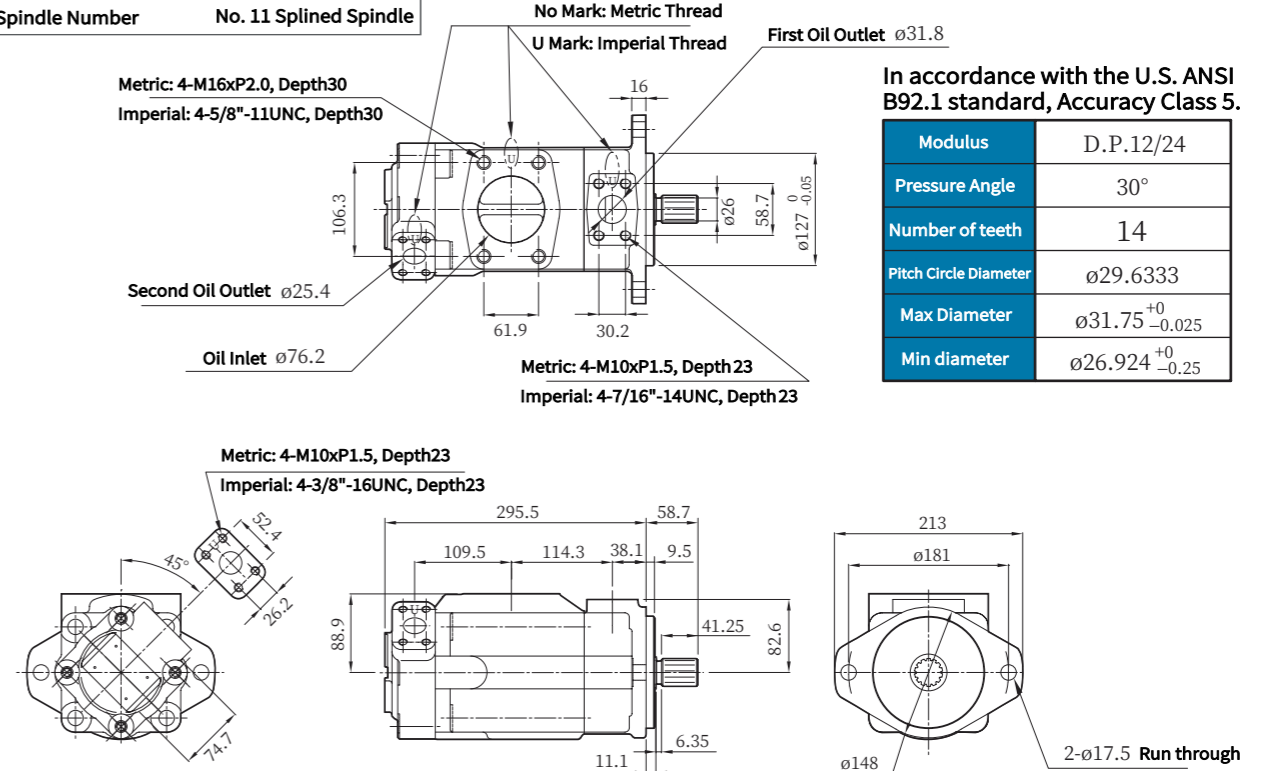


V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

3525V/VQ Flange-Mount Type

Spindle Number No. 11 Spined Spindle



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

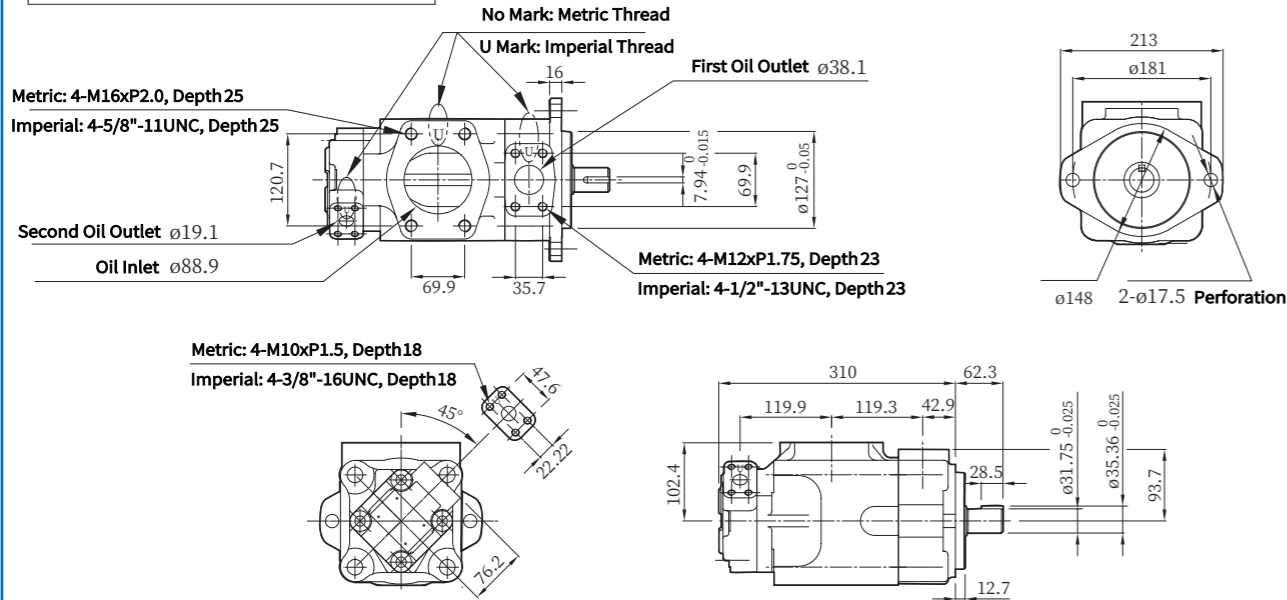
Modulus	D.P.12/24
Pressure Angle	30°
Number of teeth	14
Pitch Circle Diameter	$\phi 29.6333$
Max Diameter	$\phi 31.75^{+0.025}$
Min diameter	$\phi 26.924^{+0.025}$

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

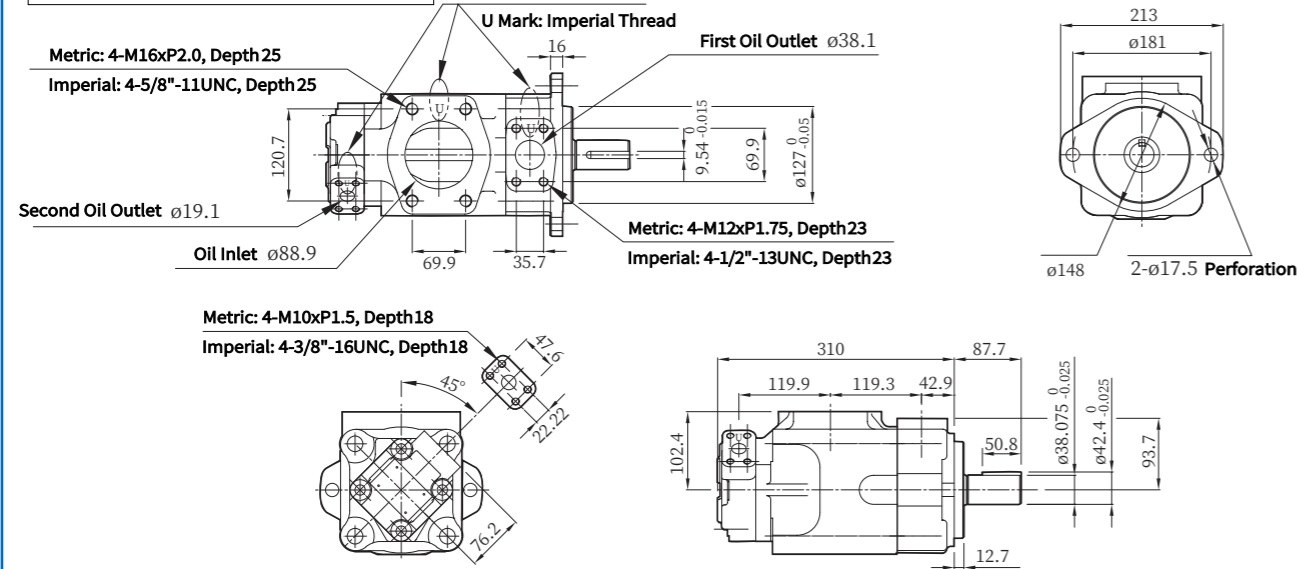
4520V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key



4520V/VQ Flange-Mount Type

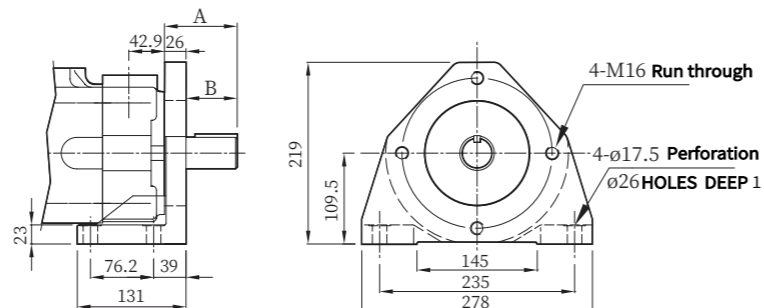
Spindle Number No. 86 Keyed Spindle



4520V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86

4520V/VQ Size Chart		
Spindle Type	A	B
Spindle 1	62.3	36.3
Spindle No. 86	87.7	61.7

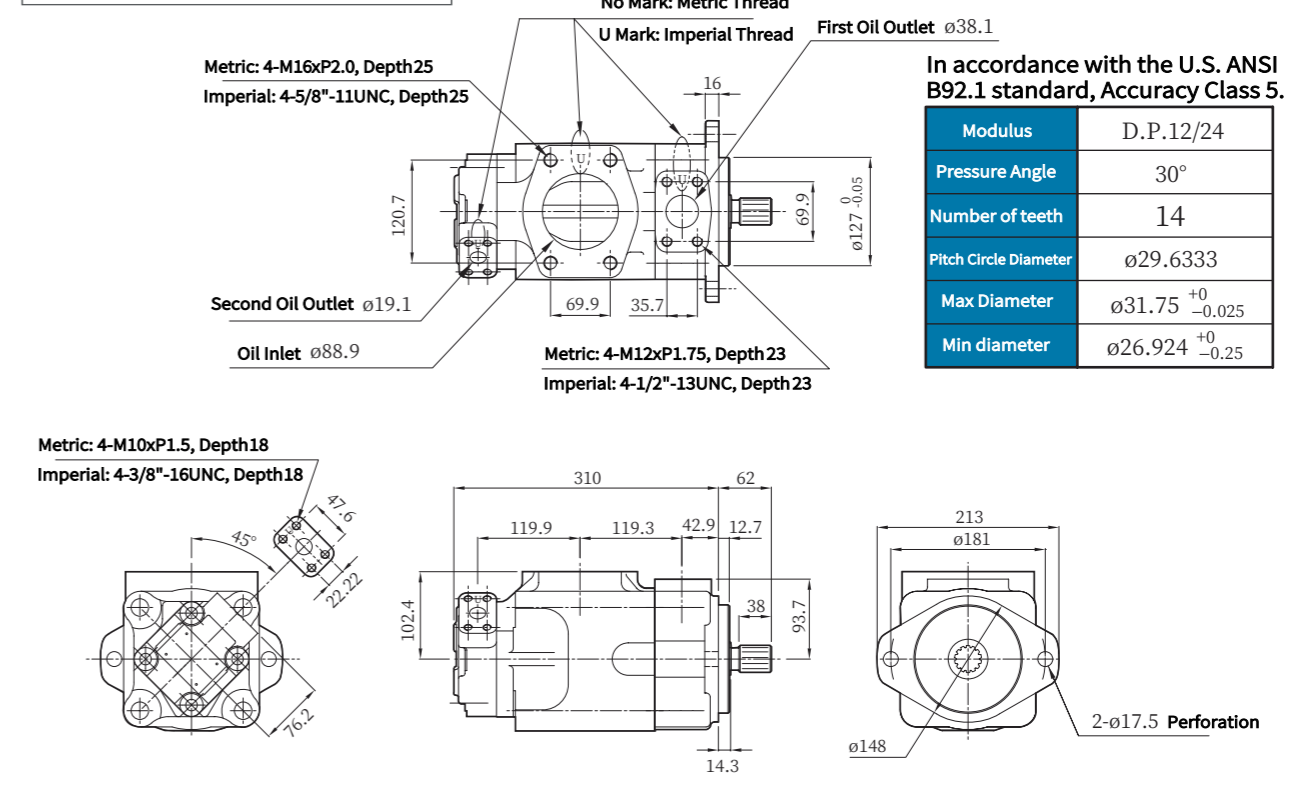


V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

4520V/VQ Flange-Mount Type

Spindle Number No. 11 Splined Spindle



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

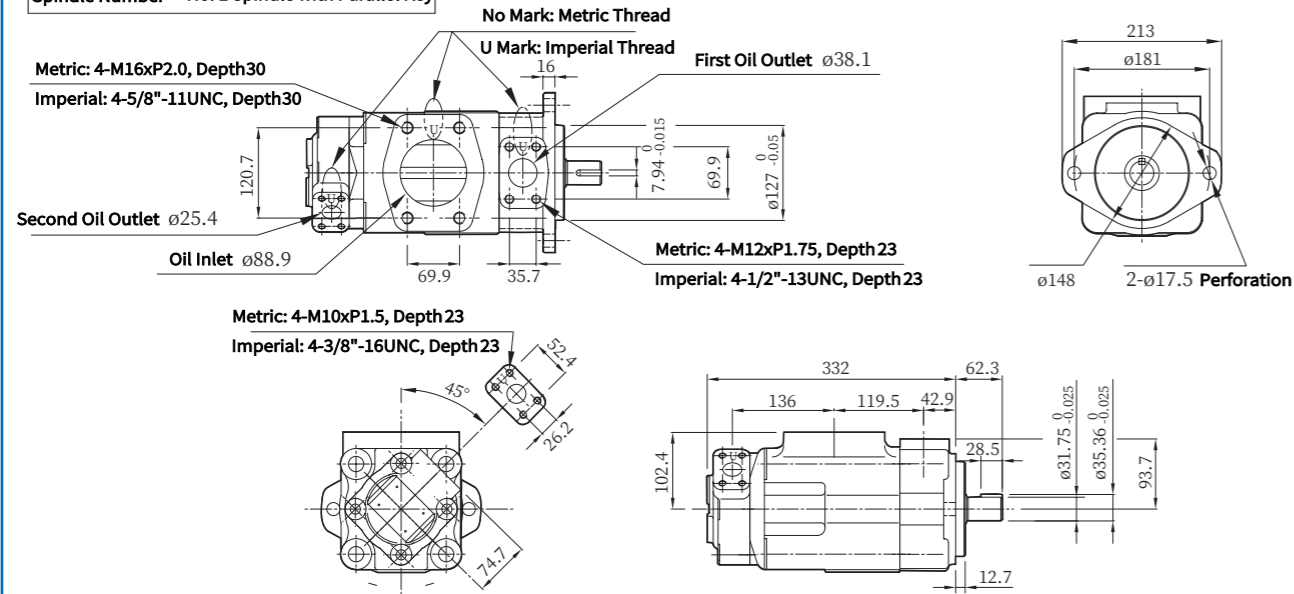
Modulus	D.P.12/24
Pressure Angle	30°
Number of teeth	14
Pitch Circle Diameter	29.6333
Max Diameter	31.75 ⁺⁰ _{-0.025}
Min diameter	26.924 ⁺⁰ _{-0.25}

V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

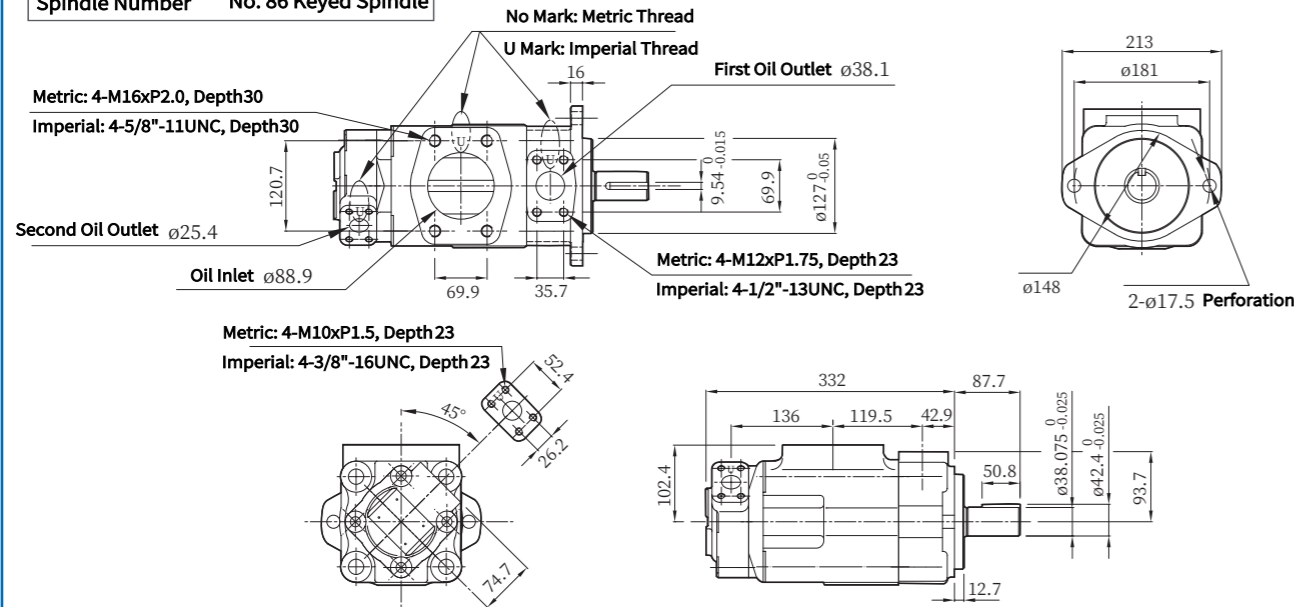
4525V/VQ Flange-Mount Type

Spindle Number No. 1 Spindle with Parallel Key



4525V/VQ Flange-Mount Type

Spindle Number No. 86 Keyed Spindle

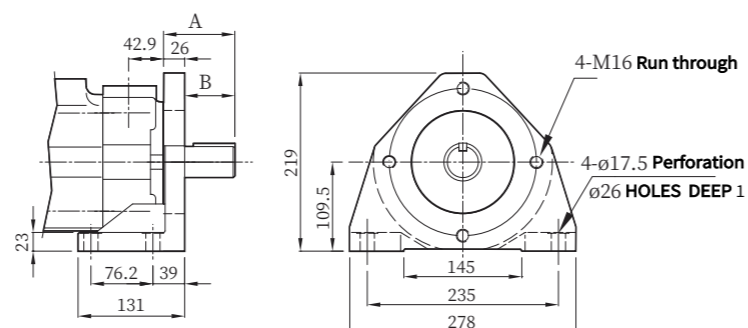


4525V/VQ Foot-Mounted Type

Spindle Number Spindles 1 & 86

4525V/VQ Size Chart

Spindle Type	A	B
Spindle 1	62.3	36.3
Spindle No. 86	87.7	61.7

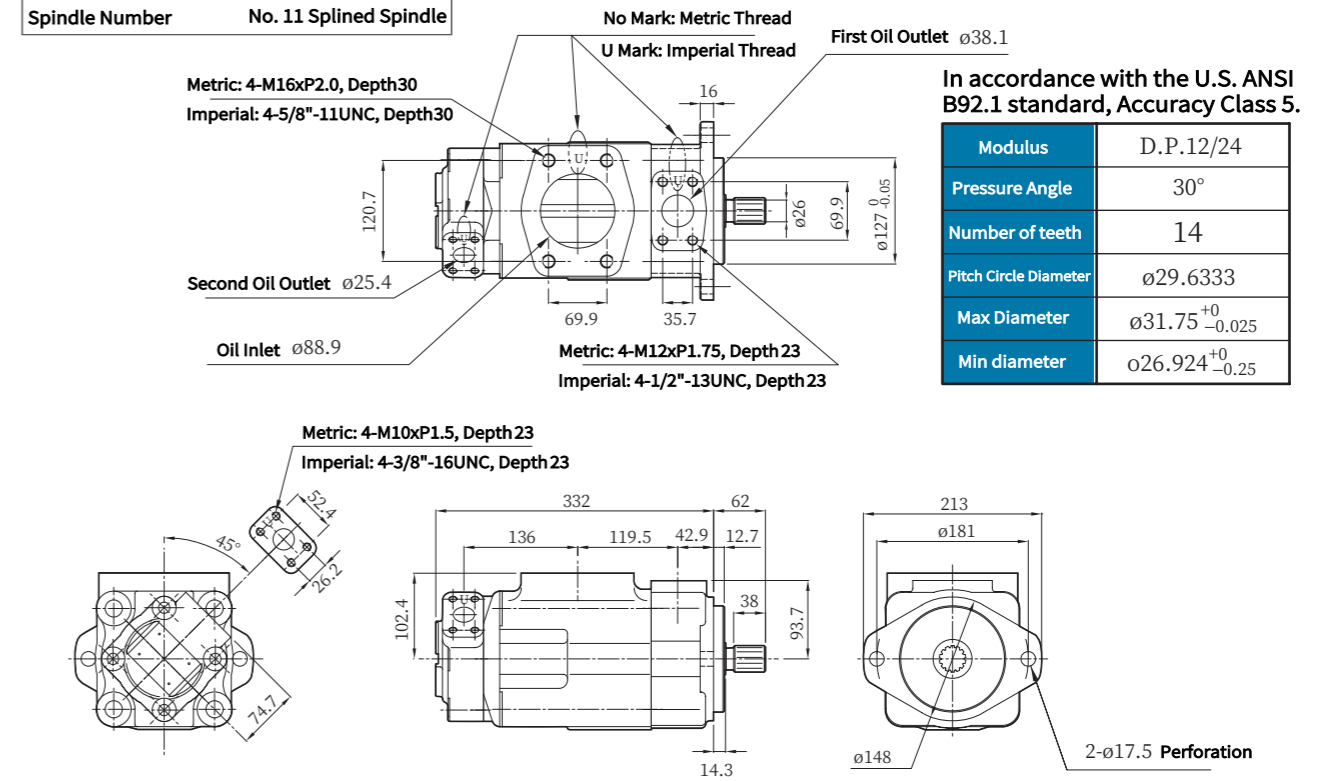


V/VQ Series Double Vane Pumps

Maximum pressure 210 bar

4525V/VQ Flange-Mount Type

Spindle Number No. 11 Spined Spindle



In accordance with the U.S. ANSI B92.1 standard, Accuracy Class 5.

Modulus	D.P.12/24
Pressure Angle	30°
Number of teeth	14
Pitch Circle Diameter	ø29.6333
Max Diameter	ø31.75 ⁺⁰ _{-0.025}
Min diameter	ø26.924 ⁺⁰ _{-0.25}

