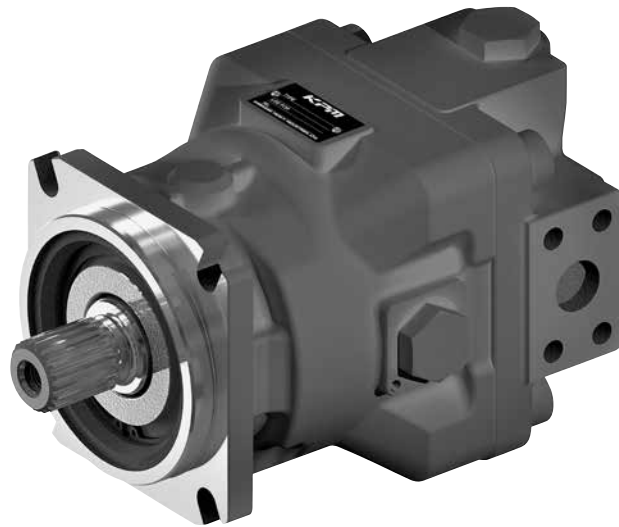


## Fixed Displacement Type Axial Piston Motors



### ■ Specifications

Size : 85, 112, 160

Nominal Pressure : 42 (6,090 psi)

Maximum Pressure : 50 (7,250 psi)

### ■ General Descriptions

- Applicable to an open circuit and closed circuit.
- Applicable to construction machinery and industrial vehicles.
- Swash plate design allows for a compact motor.
- High power density.

### ■ Features

#### **Superior performance at High and Low speed**

Optimized rotary balance design enables high speed performance and excellent low speed characteristics.

#### **Low noise**

Swash plate configuration provides the low noise.

#### **Compact size**

Swash plate configuration provides the more compact structure and flexibility in system design.

#### **Long bearing life**

Swash plate configuration results in longer bearing life.

# 8 M7X Ordering Code

Model Code **M7X** **85** **A** **A** **1** **2** - **A** **3** **B** **1** - **\***

**1. M7X Series**

M7X Series, Fixed Displacement, Axial Piston Motor, Applicable in Both Open and Closed Loops

**2. Size**

	85	112	160
Standard Size	●	●	●

**3. Series Specifications**

A	Standard
---	----------

**4. Mounting Flange and Port Position**

	Mounting	Port Position	85	112	160
A	SAE J744, 4-bolt Mount	Rear	●	●	●
B	SAE J744, 4-bolt Mount	Side	●	●	●
C	ISO3019-2, 4-bolt Mount	Rear	●	●	●
D	ISO3019-2, 4-bolt Mount	Side	●	●	●

**5. Port and Flange Fixing Thread**

	Thread Port Type	Flange Fixing Thread Type	85	112	160
1	ANSI ISO11926	ANSI ASME B1.1	●	●	●
4	Parallel Piping ISO228	Metric ISO724	●	●	●

**6. Shaft End**

	Standard	Specification	85	112	160
2	ANSI B92.1	1 3/4 in 13T 8/16DP	—	●	●
4	ANSI B92.1	1 3/8 in 21T 16/32DP	●	—	—
5	DIN5480	W35x2x16x9 g	○	—	—
6	DIN5480	W40x2x18x9 g	●	●	—
7	DIN5480	W45x2x21x9 g	—	●	●
8	DIN5480	W50x2x24x9 g	—	○	●
9	ANSI B92.1	1 1/4 in 14T 12/24DP	●	—	—

**7. Displacement Sett**

Size	85	A : 90	●	B : 80	●	C : 75	○	D : 85	●
	112	A : 112	●	B : —	—	C : —	—	D : —	—
	160	A : 160	●	B : —	—	C : —	—	D : —	—

**8. Optional Valve**

	Counter Balance Valve	Flushing Valve	85	112	160
Blank	w/o Counter Balance Valve	w/o Flushing Valve	●	●	●
X	w/ Counter Balance Valve Hoist at CW rotation (A port inlet) viewed from the shaft end	w/o Flushing Valve	○	○	○
Y	w/ Counter Balance Valve Hoist at CCW rotation (B port inlet) viewed from the shaft end	w/o Flushing Valve	○	○	○
Z	w/o Counter Balance Valve	w/ Flushing Valve	○	○	○

**9. Port Option for Loop Flushing Valve Assembly**

		85	112	160
Blank	w/o Any Accessory	●	●	●
A	Parallel Piping ISO228	○	○	○
B	ANSI ISO11926	○	○	○

**10. Speed Sensor**

		85	112	160
1	w/o Speed Sensor	●	●	●
2	w/ Speed Sensor (A port side)	●	●	●
B	w/ Speed Sensor (B port side)	●	●	●

**11. Design Code**

		85	112	160
**	01~	●	●	●

● : Available  
○ : Under development  
— : Not available

# 9

## Technical Information

### 9-1 Specifications

#### M7X Series

Size		85	112	160
Max. Displacement : $q_{max}$	cm <sup>3</sup> (in <sup>3</sup> )	90 (5.5)	112 (6.9)	160 (9.8)
Max. Speed : $N_{nom}$	min <sup>-1</sup> (rpm)	4,500	3,550	3,100
Nominal pressure : $P_{nom}$ *1	MPa (psi)	42 (6,092)		
Max. Pressure : $P_{max}$ *2	MPa (psi)	50 (7,252)		
Theoretical output torque	Nm (lbf ft)	602 (444)	749 (552)	1,070 (789)
Power	kW (hp)	284 (381)	278 (373)	347 (465)
Max. Flow : Q	L/min (gallon/min)	405 (107)	398 (105)	496 (131)
Moment of inertia	kg · m <sup>2</sup>	0.011	0.017	0.030
Volume in the case	L (gallon)	0.5 (0.21)	0.5 (0.21)	1.2 (0.32)
Mass	kg (lb)	26	34	45
Temperature	°C (°F)	-20 to +115 (-4 to +239) at drain port -20 to +90 (-4 to +194) at inlet port		
Coating		Red synthetic resin primer		

\* 1 : Nominal pressure corresponds to the design pressure to provide appropriate performance, function, and service life.

: Nominal pressure corresponds to the design pressure at which the products will function properly.

\* 2 : Summation of pressure on A and B port shall be 56 MPa or less.

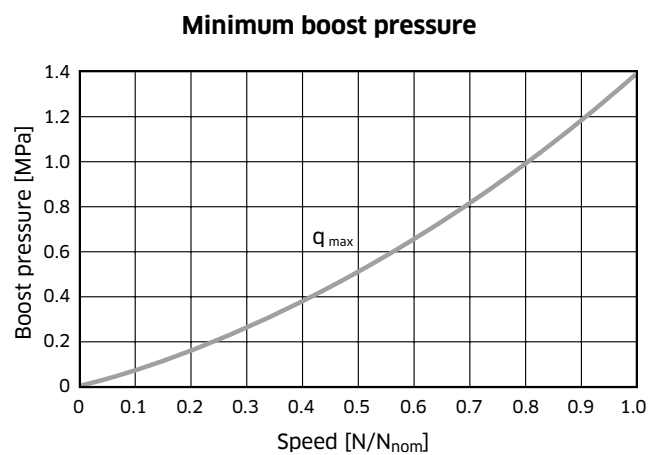
## 9. Technical Information

### 9-2 Precautions for System Design

#### ◆ Minimum. Boost Pressure

To prevent cavitation when the motor is operating in a pumping mode, a positive pressure is required at the suction port.

The figure on the right shows the minimum boost pressure requirement based on regular operation. In case of a rapid change of the flow, more boost pressure must be applied.

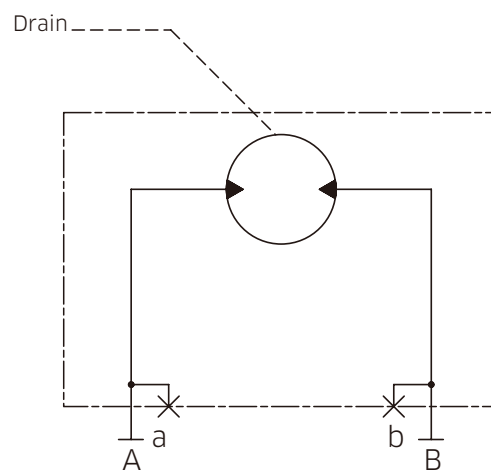


## 9. Technical Information

### 9-3 Optional Valve

#### Ordering Code [8] : Blank, X, Y, Z

##### ◆ Blank : w/o Counter Balance Valve, w/o Flushing Valve



##### ◆ X, Y : w/ Counter Balance Valve, w/o Flushing Valve (Under development)

Counter Balance Valve is used for hoisting on the winch application.

##### ◆ Z : w/o Counter Balance Valve, w/ Flushing Valve (Under development)

The function is chosen in case that the circuit needs additional cooling or minimum boost pressure needs to be ensured.

## 9. Technical Information

### 9-4 Speed Sensor

#### Ordering Code [10] : 1, 2, B

##### ◆ 1 : w/o Speed Sensor

- A speed sensor is not installed.

##### ◆ 2 : w/ Speed Sensor (A port side)

- A speed sensor that detects the motor speed and direction is installed at A port side.

##### ◆ B : w/ Speed Sensor (B port side)

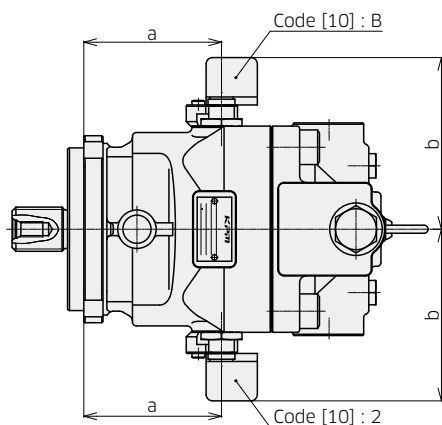
- A speed sensor that detects the motor speed and direction is installed at B port side.

#### Specification

Supply Voltage : 4.5V ~ 26V DC

Mating Connector : TE Connectivity AMP Superseal 1.5 series, 4 positions(part number : 282088)

IP Protection Rating : IP69K



			M7X85	M7X112	M7X160
a [mm]	Code [4]	A, B	107.5	116.5	124.5
		C, D	85.0	84.5	94.5
b [mm]			134	139	147
Pulse Frequency [pulse/rev]			71	77	87

# 10

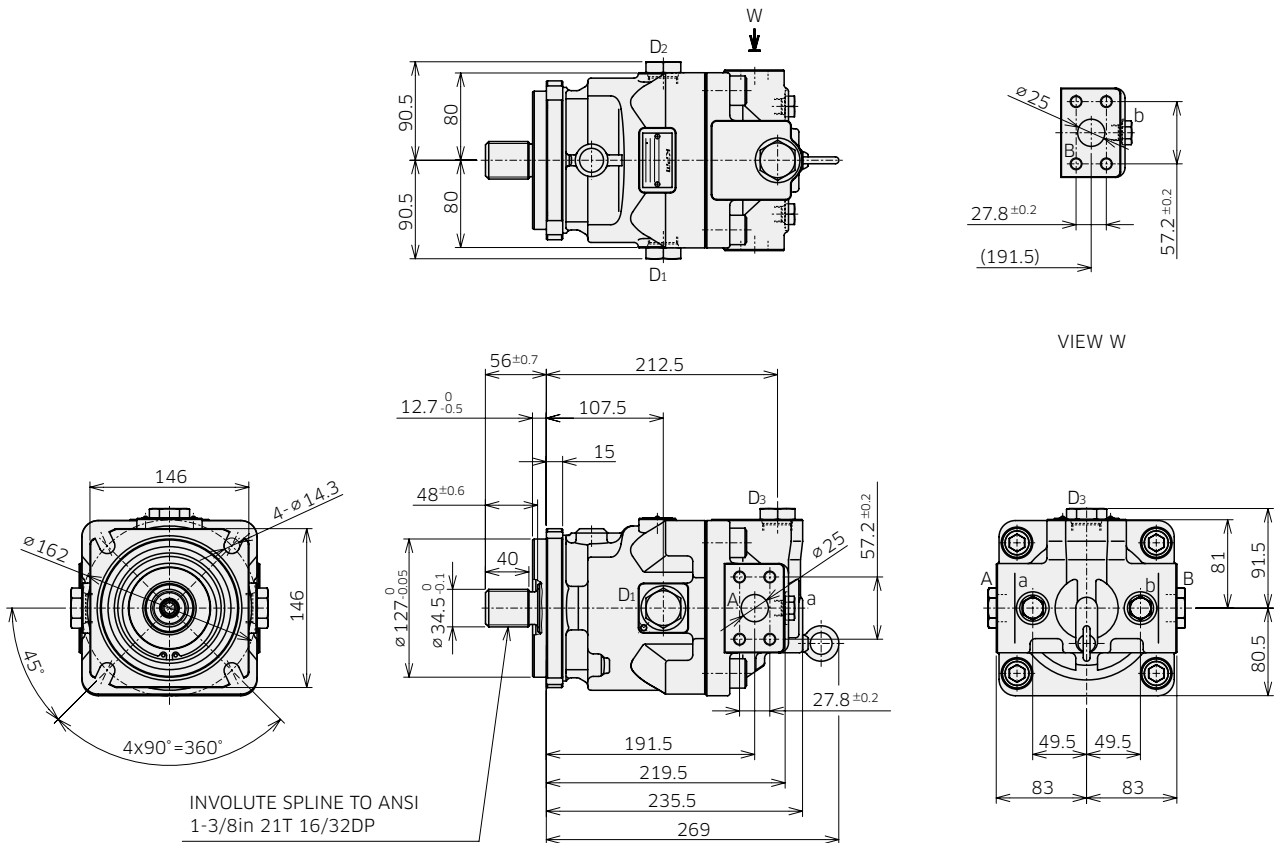
# Dimensions

## Installation Dimensions

\* Dimensions in mm.

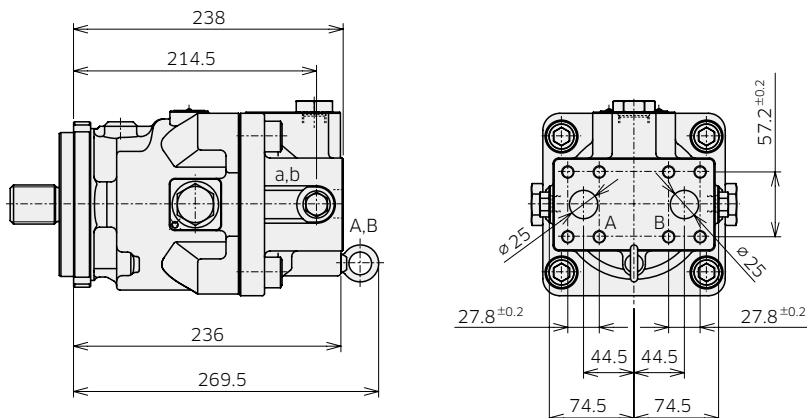
### ◆ M7X85 SAE Mounting, Side Port

Model Code : M7X 85 A B 1 4 - A 1



### ◆ M7X85 SAE Mounting, Rear Port

Model Code : M7X 85 A A 1 4 - A 1



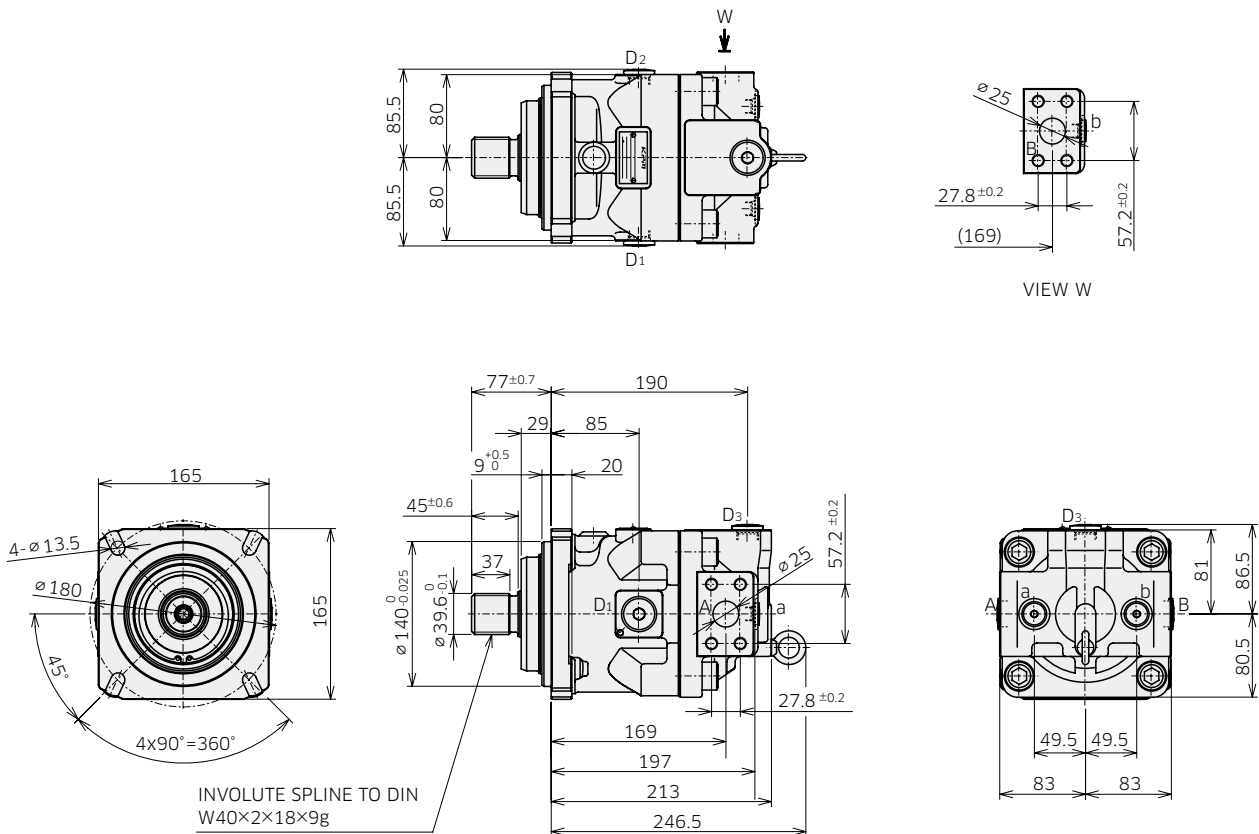
## 10. Dimensions

# Installation Dimensions

\* Dimensions in mm.

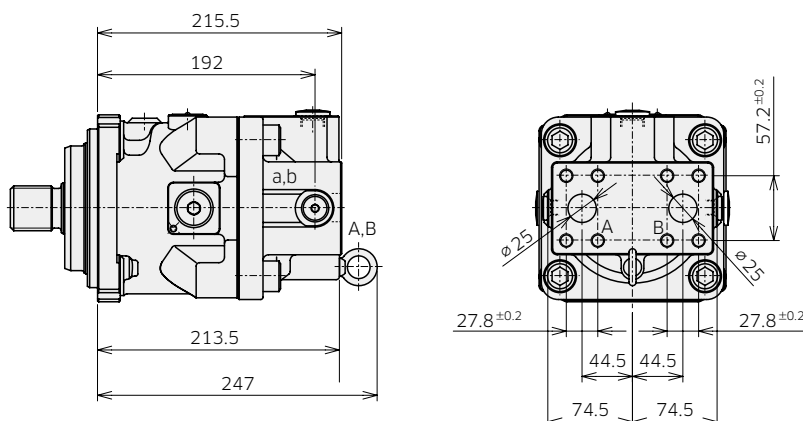
### ◆ M7X85 ISO Mounting, Side Port

Model Code : M7X 85 A D 4 6 - A 1



### ◆ M7X85 ISO Mounting, Rear Port

Model Code : M7X 85 A C 4 6 - A 1

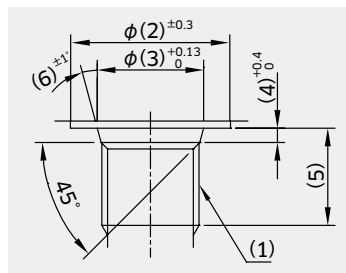




## 10. Dimensions

# Installation Dimensions

### ◆ M7X85 Port and Flange Fixing Thread (Ordering Code [5]) Drain and Gauge Port



\* Dimensions in mm.

ANSI thread type (Code : 1)

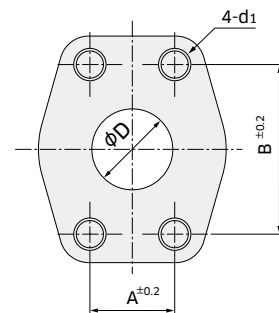
	Symbol	(1)	(2)	(3)	(4)	(5)	(6)	Tightening torque (Nm)
Gauge port	a, b	9/16-18UNF-2B	24	15.6	2.5	15	12	59
Drain port	D1 to D3	1-1/16-12UN-2B	41	29.2	3.3	19	15	170

Parallel piping thread type (Code : 4)

	Symbol	(1)	(2)	(3)	(4)	(5)	(6)	Tightening torque (Nm)
Gauge port	a, b	G 1/4	24	15.6	2.5	15	15	36
Drain port	D1 to D3	G 1/2	34	22.6	2.5	19	15	108

Flange port

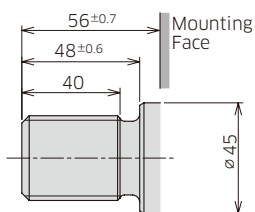
Port thread type code	d1	A	B	D
1	7/16-14UNC-2B	27.8	57.2	25
4	M12	27.8	57.2	25



### ◆ Shaft End (Ordering Code [6])

#### ANSI B92.1a

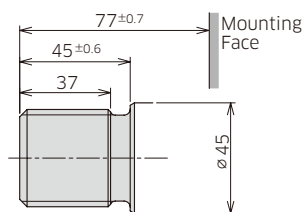
(1-3/8in 21T 16/32DP)



Code : 4

#### DIN 5480

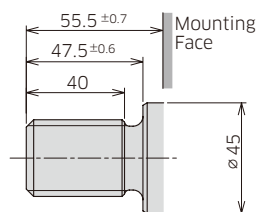
(W40x2x18x9g)



Code : 6

#### ANSI B92.1a

(1-1/4in 14T 12/24DP)



Code : 9

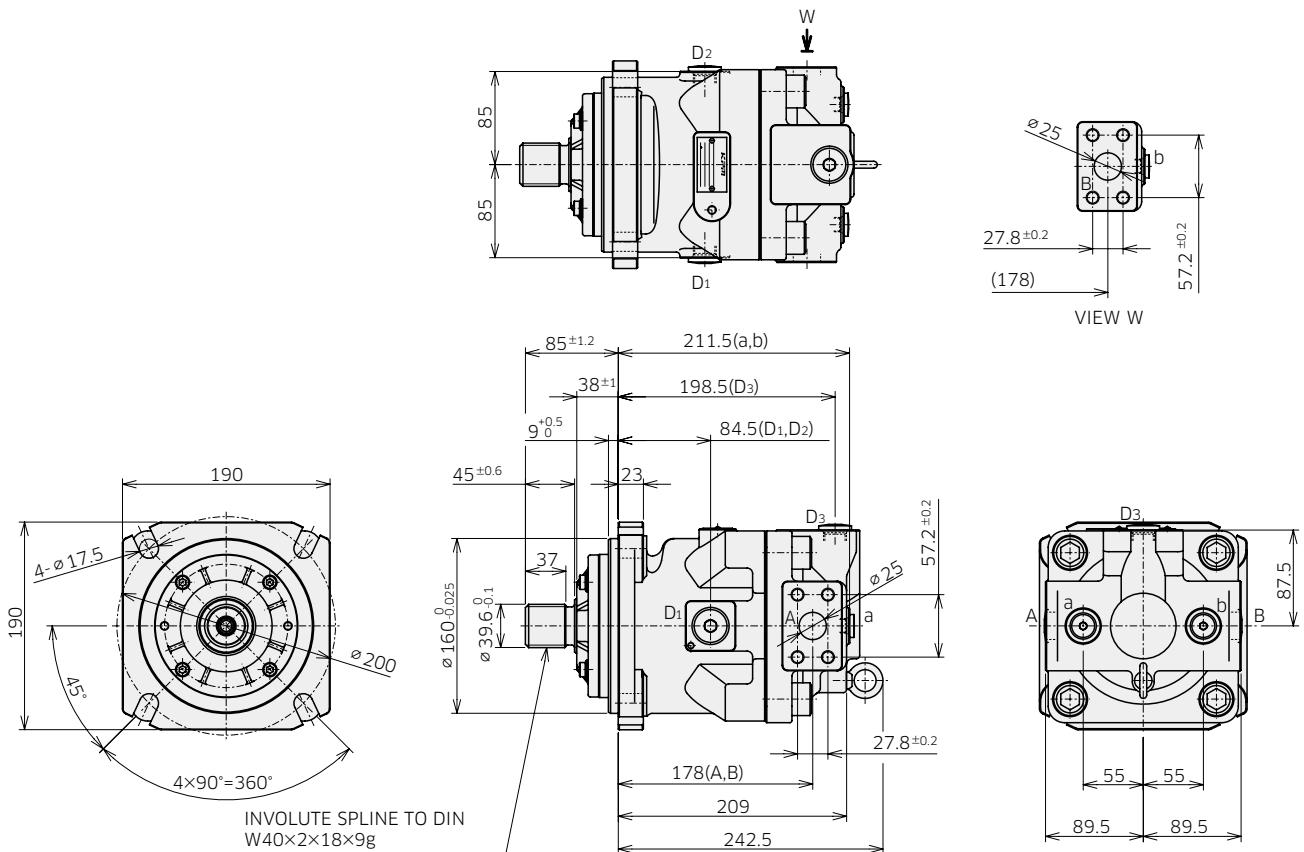
## 10. Dimensions

# Installation Dimensions

\* Dimensions in mm.

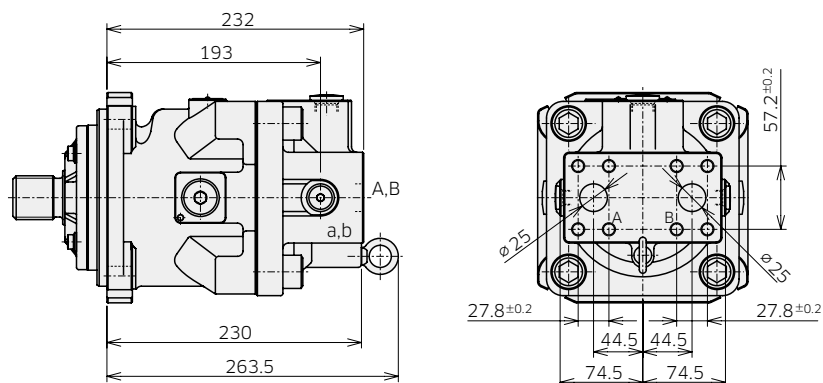
### ◆ M7X112 ISO Mounting, Side Port

Model Code : M7X 112 A D 4 6 - A 1



### ◆ M7X112 ISO Mounting, Rear Port

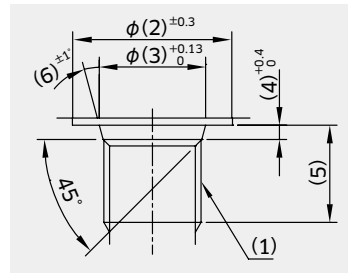
Model Code : M7X 112 A C 4 6 - A 1



## 10. Dimensions

# Installation Dimensions

### ◆ M7X112 Port and Flange Fixing Thread (Ordering Code [5]) Drain and Gauge Port



\* Dimensions in mm.

ANSI thread type (Code : 1)

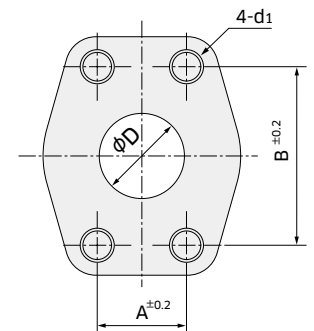
	Symbol	(1)	(2)	(3)	(4)	(5)	(6)	Tightening torque (Nm)
Gauge port	a, b	9/16-18UNF-2B	24	15.6	2.5	15	12	59
Drain port	D1 to D3	1-1/16-12UN-2B	41	29.2	3.3	19	15	170

Parallel piping thread type (Code : 4)

	Symbol	(1)	(2)	(3)	(4)	(5)	(6)	Tightening torque (Nm)
Gauge port	a, b	G 1/4	24	15.6	2.5	15	15	36
Drain port	D1 to D3	G 1/2	34	22.6	2.5	19	15	108

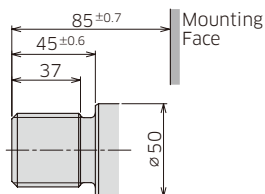
Flange port

Port thread type code	d1	A	B	D
1	7/16-14UNC-2B	27.8	57.2	25
4	M12	27.8	57.2	25



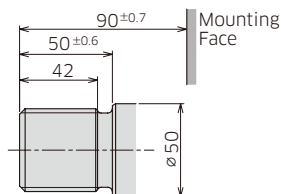
### ◆ Shaft End (Ordering Code [6])

**DIN 5480**  
(W40x2x18x9g)



Code : 6

**DIN 5480**  
(W45x2x21x9g)



Code : 7

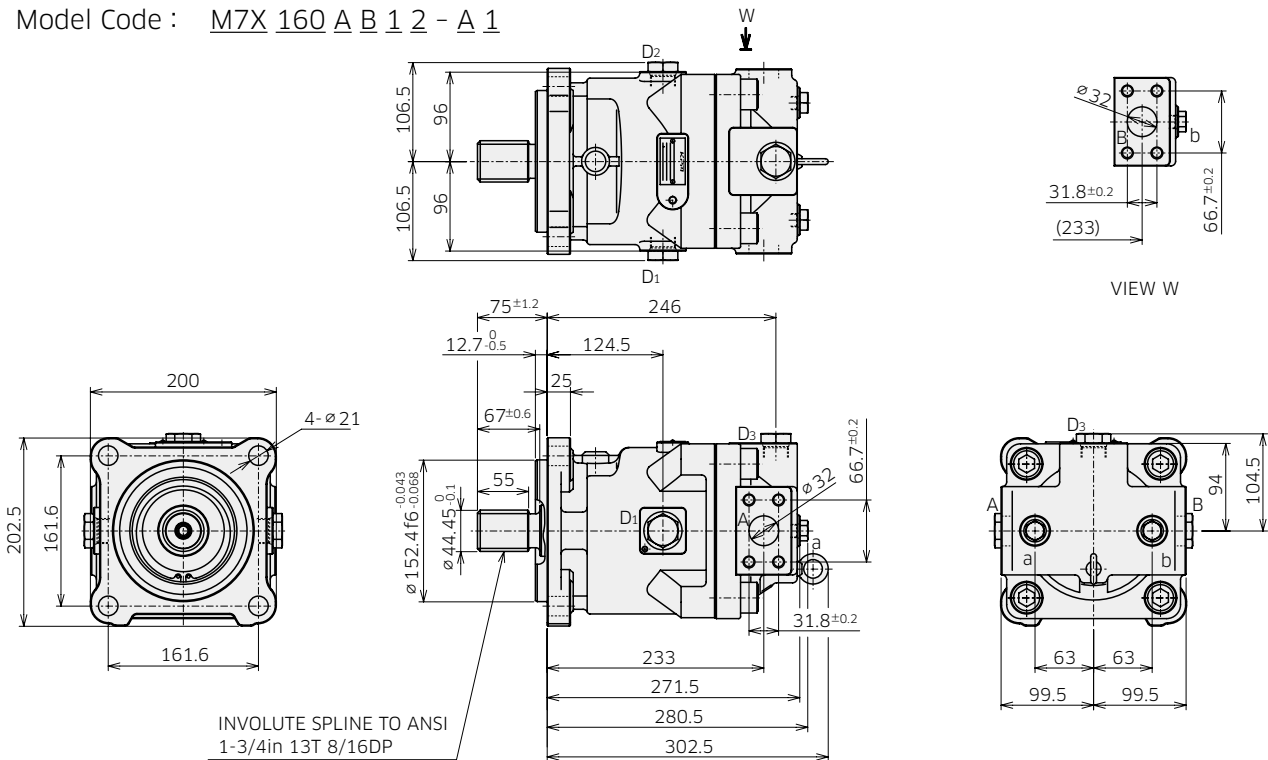
## 10. Dimensions

# Installation Dimensions

\*Dimensions in mm.

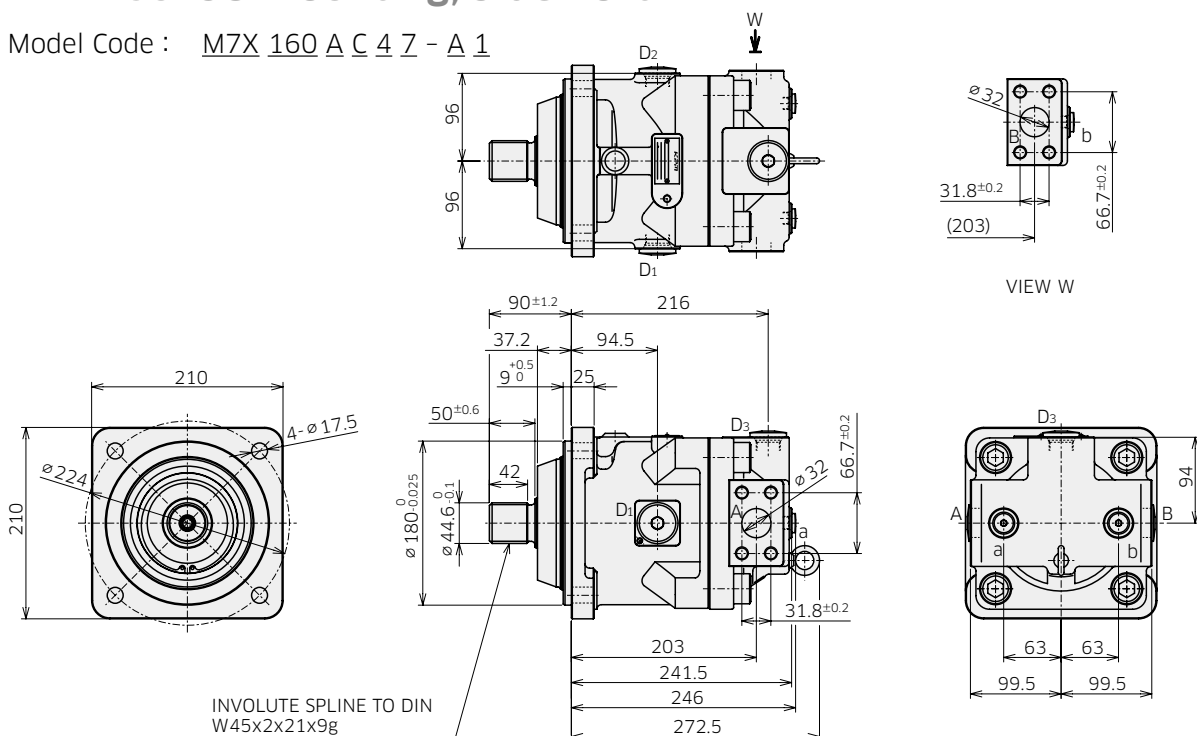
### ◆ M7X160 SAE Mounting, Side Port

Model Code : M7X 160 A B 1 2 - A 1



### ◆ M7X160 ISO Mounting, Side Port

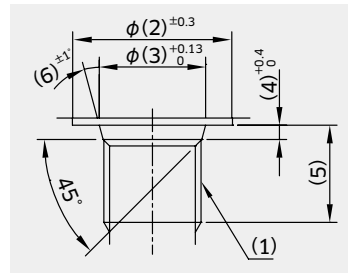
Model Code : M7X 160 A C 4 Z - A 1



## 10. Dimensions

# Installation Dimensions

### ◆ M7X160 Port and Flange Fixing Thread (Ordering Code [5]) Drain and Gauge Port



\* Dimensions in mm.

ANSI thread type (Code : 1)

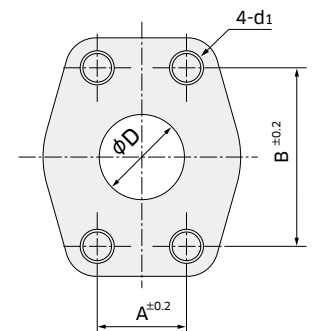
	Symbol	(1)	(2)	(3)	(4)	(5)	(6)	Tightening torque (Nm)
Gauge port	a, b	9/16-18UNF-2B	24	15.6	2.5	12.7	12	59
Drain port	D1 to D3	1-1/16-12UN-2B	41	29.2	3.3	19	15	170

Parallel piping thread type (Code : 4)

	Symbol	(1)	(2)	(3)	(4)	(5)	(6)	Tightening torque (Nm)
Gauge port	a, b	G 1/4	24	15.6	2.5	15	15	36
Drain port	D1 to D3	G 3/4	45	30.8	3.5	20	15	170

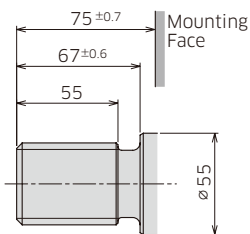
Flange port

Port thread type code	d1	A	B	D
1	1/2-13UNC-2B	31.8	66.7	32
4	M14	31.8	66.7	32



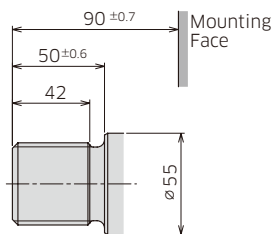
### ◆ Shaft End (Ordering Code [6])

**ANSI B92.1a**  
(1-3/4in 13T 8/16DP)



Code : 2

**DIN 5480**  
(W45x2x21x9g)



Code : 7