

YUKEN

Pub. EC-1909

ASR Series

AC Servo Motor Driven Pumps



YUKEN KOGYO CO.,LTD.

■ **Hydraulic Fluids**

Use clean petroleum based fluids equivalent to ISO VG 32 or 46 under conditions that meet the following requirements: a viscosity of 20 to 400 mm²/s and a fluid temperature of 0 to 60 °C.

■ **Control of Contamination**

Hydraulic fluid contamination may cause pump failure or shorten the service life of the pump. Take great care to control the contamination of hydraulic fluid and maintain the degree of contamination within NAS Grade 9. Be sure to provide a tank filter of at least 100 μm (150 mesh) for the suction line and a line filter of 10 μm or finer for the return line.

■ **Transportation**

For transportation, use the lifting rings on the pump. Do not use lifting cables at places other than the lifting rings.

■ **Pump Installation**

Install the pump with the filling port facing upward.

■ **Suction Pressure**

Keep the suction pressure at the pump inlet between - 16.7 and + 50 kPa. For suction piping, use pipes of the nominal diameters shown below. Do not position the suction port higher than the fluid level.

Model	Nominal Dia.
ASR 1/ASR 2	1
ASR 3	1 1/4
ASR 5	1 1/2
ASR10	3

■ **Piping Considerations**

When using steel pipes, they may place excessive load on the pump, resulting in noise. If there is a possibility that steel pipes may place such load on the pump, use rubber hoses.

■ **Drain Piping**

For drain piping, refer to the table below. Install the piping in such a way that the steady state pressure in the housing is 0.1 MPa or less, and the surge pressure is 0.5 MPa or less. Use a pipe of 1 m or shorter. Instead of joining the drain pipe to other return lines, run it independently. Make sure that the pipe end is submerged in fluid.

[Recommended Drain Pipe Size]

Model	Pipe/Joint Size	Pipe Bore
ASR 1/ASR 2	3/8 (Bore: 8.5 dia. or more)	10 dia. or more
ASR 3	1/2 (Bore: 12 dia. or more)	12 dia. or more
ASR 5/ASR10	3/4 (Bore: 16 dia. or more)	19 dia. or more

■ Pump Startup

Before initial operation, pour clean hydraulic fluid through the filling port into the pump. Upon startup, to prevent the pump from becoming air-bound, adjust the hydraulic circuit to circulate the pump discharge fluid directly into the tank, or control the directional valves to run the actuator with no load.

■ Air Bleeding

Air in the pump and lines may cause vibration. Completely bleed air from them. An air bleed valve (model number: ST1004-**-10*, see page 22) is recommended on the discharge side.

[Fluid Filling Quantity]

Model	Filling Quantity cm ³
ASR 1/ASR 2	600
ASR 3/ASR 5	1200
ASR 10	2500

■ Setting of Safety Valve (Pressure)/Discharge Flow

By default, the pump discharge flow is set at the value shown below, and the safety valve is set at 21 MPa (19.5 MPa for ASR2). Adjust the discharge flow and safety valve (pressure) settings according to operating conditions.

[Default Setting of Discharge Flow]

Model Numbers	Single Displacement Type "X" cm ³ /rev	Dual Displacement Type "W" cm ³ /rev	
		Large Displacement	Small Displacement
ASR 1	15.8	15.8	8
ASR 2	22.2	22.2	8
ASR 3	36.9	36.9	10
ASR 5	56.2	56.2	14
ASR10	100	100	20

● Discharge Flow Adjustment

Turning the flow adjustment screw (large displacement side for the dual displacement type) clockwise decreases the discharge flow. For the dual displacement type, turning the flow adjustment screw on the small displacement side clockwise increases the discharge flow.

[Displacement Change Per Turn of the Flow Adj. Screw]

Model Numbers	Displacement Change Per Turn cm ³ /rev		
	Single Displacement Type	Dual Displacement Type	
		Large Displacement	Small Displacement
ASR 1	1.4	1.4	1.5
ASR 2	2.0	2.0	2.1
ASR 3	2.9	2.9	2.8
ASR 5	3.9	3.9	3.7
ASR10	5.4	5.4	7.9

★ For the relationship between the flow adjustment screw position and flow adjustment, see pages 6 and 7.

● Safety Valve (Pressure) Adjustment

• Single displacement type

Turning the pressure adjustment screw clockwise increases the pressure setting. See the table below for the pressure change per turn of the pressure adjustment screw. After adjustment, be sure to tighten the lock nut.

Model Numbers	Pressure Change Per Turn MPa	Max. Setting Value MPa	Min. Setting Value MPa
ASR1/ASR3/ASR5-**-HX	4.4	24.8	8
ASR10-**-HX			2
ASR2-*C-CX		19.5	2

★ For the relationship between the pressure adjustment screw position and pressure adjustment, see page 6.

• Dual displacement type

The dual displacement type does not support the full cut-off function. Provide a safety valve on the pump discharge side. Set the safety valve at a value of the maximum operating pressure + 3 to 3.5 MPa.

■ Precautions During Operation

During and for a period after operation, the surface temperature of the AC servo motor and the pump will be hot. Prevent hands and other body parts from coming into contact with them.

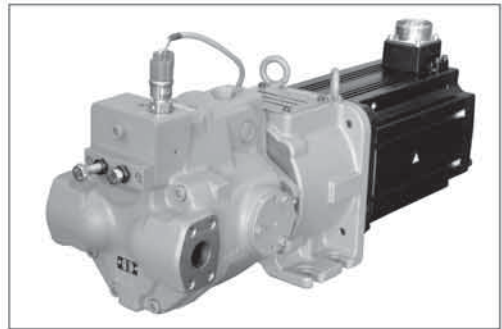
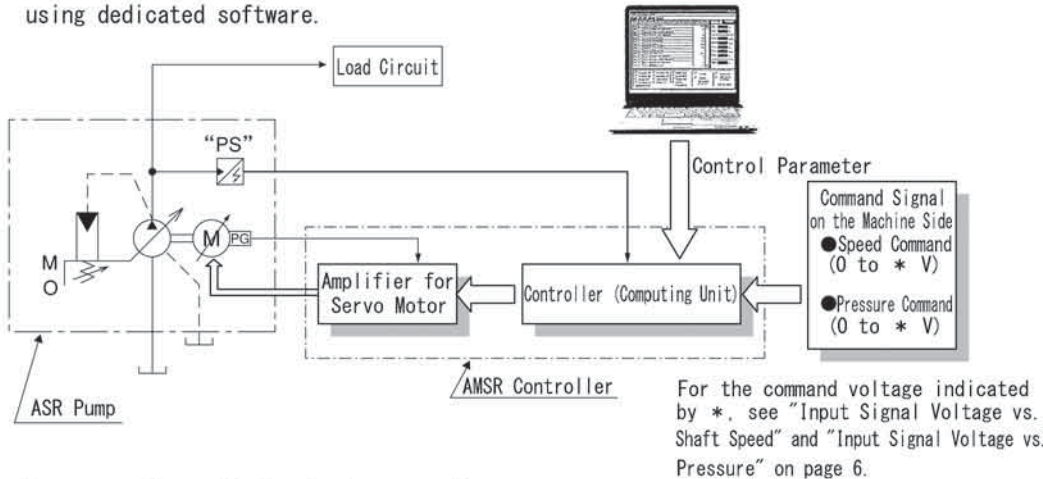
Providing flexible flow/pressure control!

ASR Series AC Servo Motor Driven Pumps

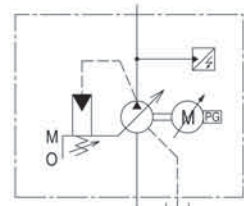
The ASR series provides variable flow by driving a piston pump directly with an AC servo motor and controlling the rotational speed in a range from zero to the maximum level. This series allows for precise control of flow/pressure by using a dedicated AMSR controller. It also offers excellent response and repeatability.

System Configuration

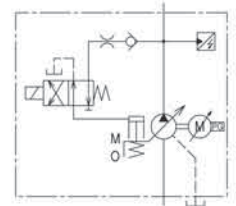
A feedback loop is formed by the AMSR controller that computes deviations between control signals from the machine side (speed and pressure commands) and sensor signals to drive the AC servo motor accordingly. Control parameters can be set digitally by using dedicated software.



Graphic Symbols



Single Displacement Type
ASR*-*-*-X*-



Dual Displacement Type
ASR*-*-*-W*-

Energy saving with low heat generation

These pumps run at a rotational speed suitable for mechanical requirements, eliminating unnecessary power loss. They minimize heat generation in the fluid and allow the use of a significantly smaller tank.

Example of Power Consumption by Pump Control Type

ASR Series	30~70	Reduction Rate 30 to 70 %
04EH Type	60~80	
Load Sensing Type	100	

Low noise

The motor operates at near-zero speed during unloaded operation or pressure control, keeping the noise level extremely low.

High performance

The AC servo motor, which directly controls the pump speed, improves response and stability at low pressures and speeds.

Digital AMSR controller that reduces add on costs

The integration of the amplifier for the servo motor and the controller saves space and wiring time. The parameters can be digitally adjusted easily.

Dual displacement type for a wider operation range

The dual displacement type has a solenoid operated directional valve to switch between large and small swash plate angles. A single pump unit of the dual displacement type can operate both with low pressure/large flow and with high pressure/small flow. Thus, in comparison to the single displacement type with the same motor capacity, the dual displacement type covers a significantly wider range of operating pressures and flow rates.

Large flow

The AMSR controller has a combination function that supports operation with large flow up to 3200 L/min (ASR10 x 16 units).

Specifications

Item		Model Numbers	ASR 1-	ASR 2-	ASR 3-	ASR 5-		ASR10-		
Power Capacity			C	C	E	G		J	M	
Pump	Flow Control	Max. Flow	39.5 L/min	55.5 L/min	92.3 L/min		129 L/min		200 L/min	
		Hysteresis	1 % or less							
		Repeatability	1 % or less							
		Input Signal Voltage	31.6 L/min / 5V	44.4 L/min / 5V	73.8 L/min / 5V	112.4 L/min / 5V		200 L/min / 5V		
		Max. Permissible Input Signal Voltage*	39.5 L/min / 6.25V	55.5 L/min / 6.25V	92.3 L/min / 6.25V	129 L/min / 5.75V				
	Pres. Control	Max. Operating Pres.	21 MPa	16 MPa	21 MPa					
		Min. Adj. Pres.	0.1 MPa							
		Hysteresis	1 % or less							
		Repeatability	1 % or less							
		Input Signal Voltage	17.5 MPa / 5V	16 MPa / 4.57V	17.5 MPa / 5V					
Max. Permissible Input Signal Voltage*	21 MPa / 6V	21 MPa / 6V								
Mass	Single Displacement Type	54 kg	54 kg	80 kg	87 kg	94 kg	175.5 kg	213 kg	233 kg	
	Dual Displacement Type	55 kg	55 kg	82 kg	89 kg	96 kg	177.5 kg	214 kg	234 kg	
AC Servo Motor Specifications	Rated Output	4.5 kW			6 kW	8 kW		11 kW		15 kW
	Insulation Class	Class F								
	Cooling System	Totally-enclosed Self-cooling						Totally-enclosed Fan-cooling		
	Cooling Fan Power Consumption	—						62W (50Hz) / 76W (60Hz)		
	Environmental Condition	Ambient Temperature	0 to + 40 °C (No Freezing)							
	Ambient Humidity	80 % RH or less (No Condensation)								
Applicable Controller Model Number		AMSR-*C-*00-10			AMSR-2DE-*00-10	AMSR-*FGI-*00-10		AMSR-*HJL-*00-10	AMSR-*KMO-*00-10	

★By adjusting the controller, the maximum flow rate/5 V (39.5 L/min/5 V) and the maximum operating pressure/5 V (21 MPa/5 V) can be set.

Model Number Designation

The model numbers below indicate packages each containing an AC servo motor driven pump, AMSR controller, and dynamic brakes.

ASR3	-4	G	-H	X	S	A100	N	-A	00	-11
Series Numbers	Power Supply Voltage	Power Capacity	Max. Operating Pres.	Flow Setting	Port Direction	Coil Type for Solenoid Operated Directional Valve	Electrical Conduit Connection for Solenoid Operated Directional Valve	Function Selection	Parameter Number	Design Number
ASR1	None : AC 200 V 4 : AC 400 V	C	H : 21 MPa	X : Single Displacement Type	S : Side	AC *1 A100 : AC100V A120 : AC120V A200 : AC200V A240 : AC240V	None : Terminal Box	A : Single B : Combination*5 : (Single Operation Allowed)	00 : Standard	11
ASR2		C	C : 16 MPa		W : Dual Displacement Type	None : Axial				DC None : DC24V D12 : DC12V D48 : DC48V
ASR3		E*3, G					AC (AC <-> DC)			
ASR5		G, J	H : 21 MPa		A : Horizontal B : Vertical	R100 : AC100V R200 : AC200V				11
ASR10		J, M								11

★1. To order an AC servo motor driven pump separately for spare use, prefix "N-" to the model number and omit the Function Selection and Parameter Number.

Example) N-ASR3-4G-HXS-11

★2. For the relationship between the power capacity and the pressure/flow in terms of specification limits, see charts on pages 8 and 9.

★3. When selecting the power capacity "E," only the input voltage of AC 200 V is available.

★4. Types shown in the shaded areas are optional. Check the delivery date before selecting them.

★5. For combination operation, consult us separately regarding the types of hydraulic circuits, components, and electric cables.

■ Solenoid Specifications for Solenoid Operated Directional Valve

Electric Source	Coil Type	Frequency Hz	Voltage V		Current & Power at Rated Voltage		
			Source Rating	Serviceable Range	Starting A	Holding A	Power W
AC	A 100	50	100	80 to 110	2.42	0.51	—
		60	100	90 to 120	2.14	0.37	
			110		2.35	0.44	
	A 120	50	120	96 to 132	2.02	0.42	
		60		108 to 144	1.78	0.31	
	A 200	50	200	160 to 220	1.21	0.25	
				180 to 240	1.07	0.19	
		60	220		1.18	0.22	
	A 240	50	240	192 to 264	1.01	0.21	
		60		216 to 288	0.89	0.15	
DC (K Series)	D 12	—	12	10.8 to 13.2	—	2.45	29
	D 24		24	21.6 to 26.4		1.23	
	D 48		48	43.2 to 52.8		0.61	
AC (AC <-> DC)	R 100	50/60	100	90 to 110	—	0.33	29
	R 200		200	180 to 220		0.16	

■ Pipe Flange Kit

No pipe flange kit is included with the pump. The pipe flange kits below are available if required.
For the details of the pipe flange kits, see pages 21 and 22.

Pump Model Numbers	Name of Port	Pipe Flange Kit Numbers		
		Threaded Connection	Socket Welding*	Butt Welding
ASR 1 ASR 2	Suction	F5-06-A-10	F5-06-B-10	F5-06-C-10
	Discharge	F5-06-A-10	F5-06-B-10	F5-06-C-10
ASR 3 ASR 5	Suction	F5-10-A-10	F5-10-B-10	F5-10-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10
ASR 10	Suction	F5-16-A-10	F5-16-B-10	F5-16-C-10
	Discharge	F5-10-A-10	F5-10-B-10	F5-10-C-10

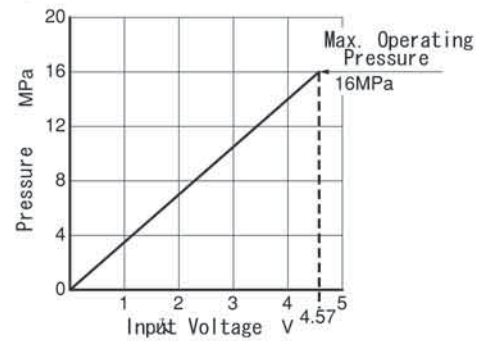
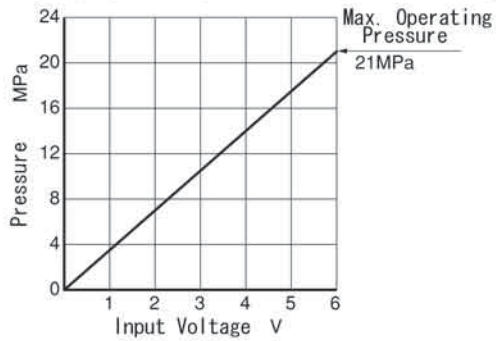
★ For the socket welding type, the operating pressure may be limited due to the flange strength. When using a socket welding flange for the discharge port, pay attention to the maximum operating pressure for each pipe flange kit.

Characteristics of Single Displacement Type

Input Signal Voltage vs. Pressure

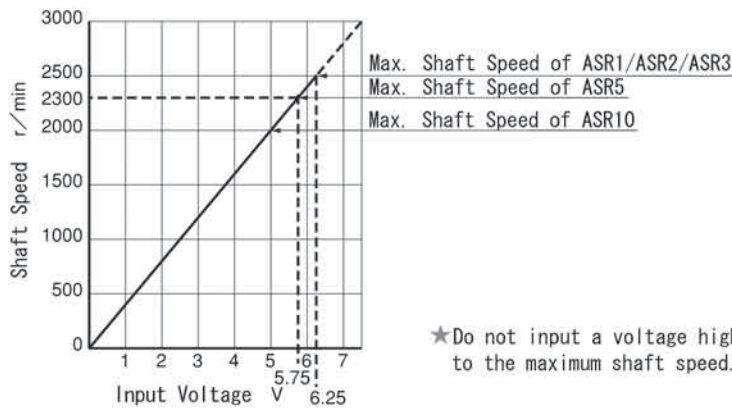
● ASR1/ASR3/ASR5/ASR10-**-HX

● ASR2-**-CX



★ Do not input a voltage higher than the level corresponding to the maximum operating pressure.

Input Signal Voltage vs. Shaft Speed



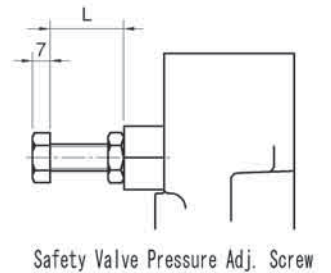
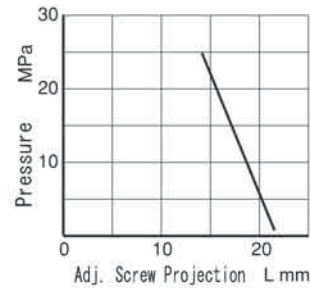
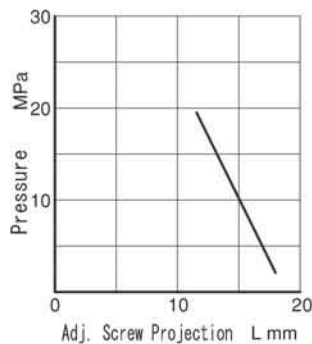
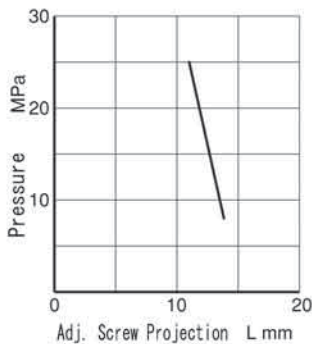
★ Do not input a voltage higher than the level corresponding to the maximum shaft speed.

Adjustment Screw Projection and Safety Valve Setting Pressure

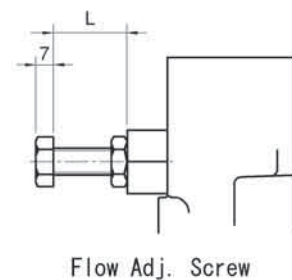
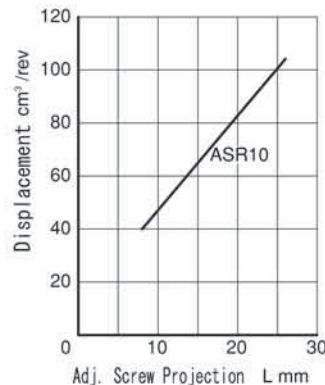
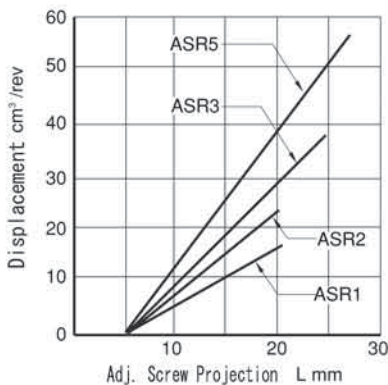
● ASR1/ASR3/ASR5-**-HX

● ASR2-**-CX

● ASR10-**-HX



Adjustment Screw Projection and Geometric Displacement



Characteristics of Dual Displacement Type

■ **Input Signal Voltage vs. Pressure**

See "Characteristics of Single Displacement Type" (page 6).

■ **Input Signal Voltage vs. Shaft Speed**

See "Characteristics of Single Displacement Type" (page 6).

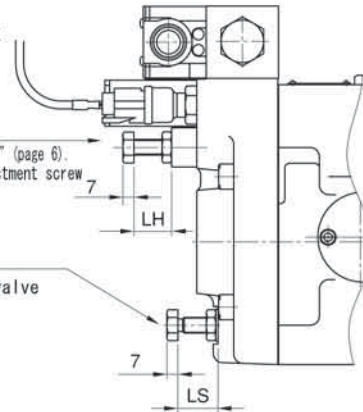
■ **Adjustment Screw Projection and Geometric Displacement**

Large Displacement Side Flow Adj. Screw (Check operation with the solenoid operated directional valve "off.")

This is the same as the single displacement type. See "Characteristics of Single Displacement Type" (page 6).
Note that the value cannot be set below the level set by the small displacement side adjustment screw

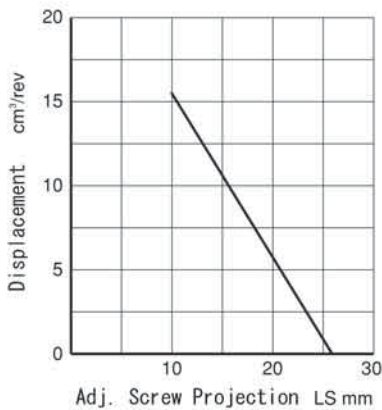
Small Displacement Side Flow Adj. Screw

(Check operation with the solenoid operated directional valve "on" and at a load pressure of 3 MPa or more.)

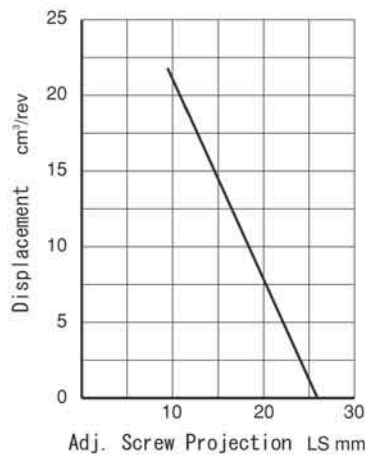


[Small Displacement]

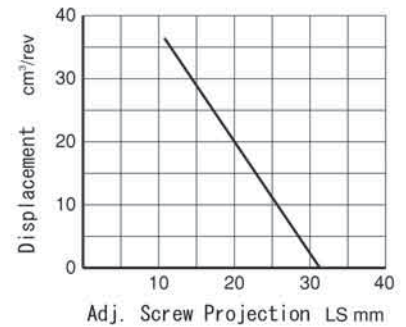
● ASR1- *C-HW



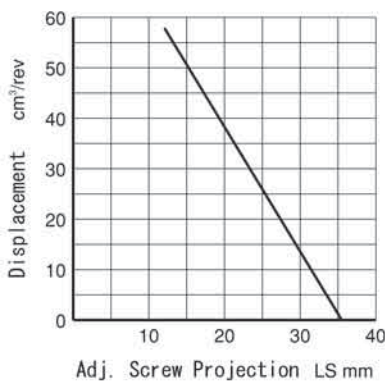
● ASR2- *C-CW



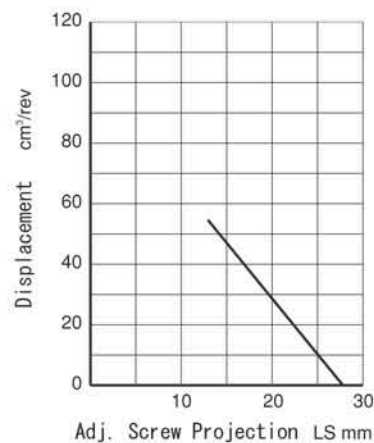
● ASR3- * *-HW



● ASR5- * *-HW



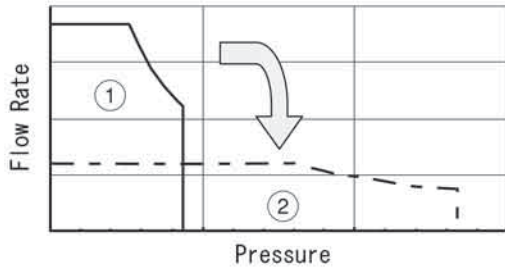
● ASR10- * *-HW



■ Single Displacement Type "X" Model Selection Chart (Representative Pressure vs. Flow Characteristics)

The area ① in each chart indicates that continuous operation is allowed by default.

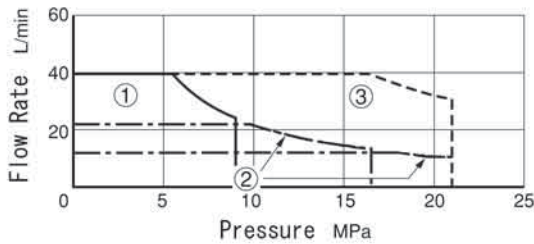
The area ② indicates that continuous operation is allowed by adjusting the maximum flow rate (see the figure below). For details, consult us separately.



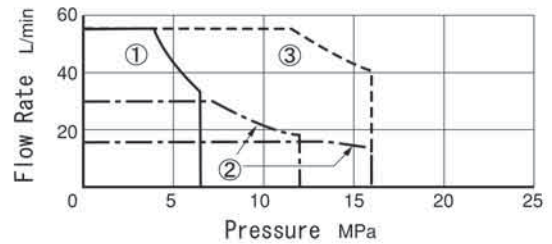
(Note) Since the ASR series employs variable displacement pumps, the pressure and flow rate ranges for continuous operation can be adjusted as shown on the left.

The area ③ in each chart indicates that intermittent operation is allowed. The allowable operation time varies depending on the cycle of operation. For details, consult us separately.

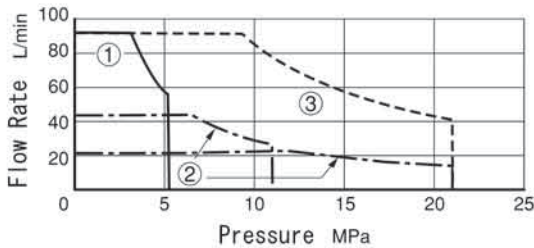
● ASR1-*C-HX*-*00-11



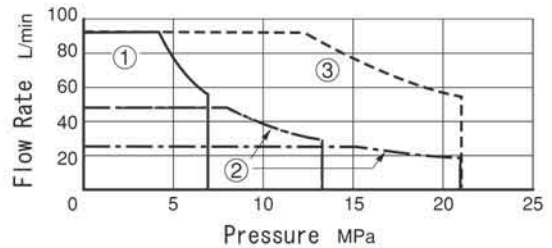
● ASR2-*C-CX*-*00-11



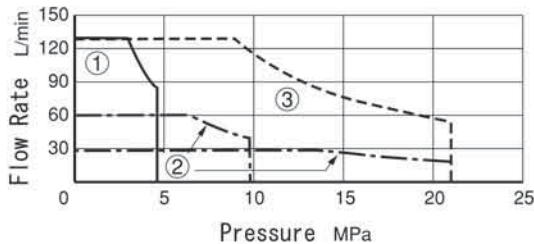
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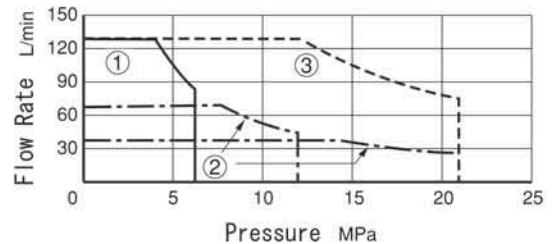
● ASR3-*G-HX*-*00-11



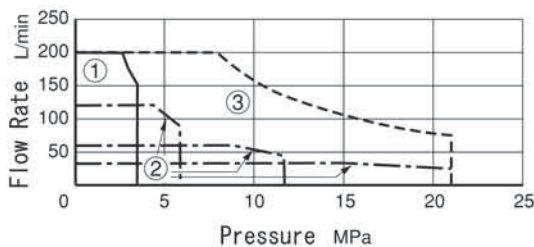
● ASR5-*G-HX*-*00-11



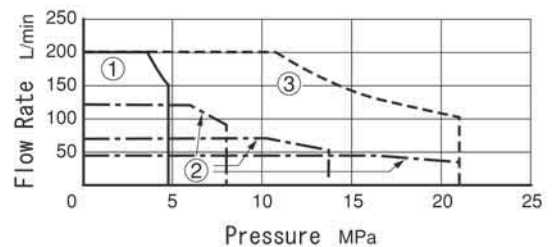
● ASR5-*J-HX*-*00-11



● ASR10-*J-HX*-*00-11

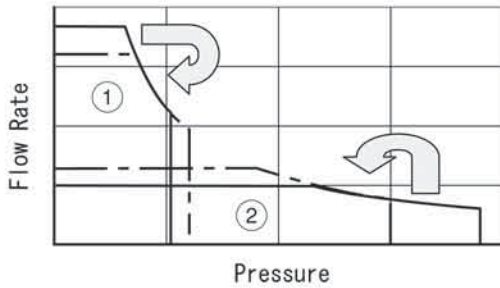


● ASR10-*M-HX*-*00-11



Dual Displacement Type "W" Model Selection Chart (Representative Pressure vs. Flow Characteristics)

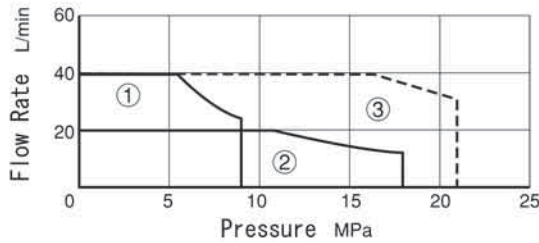
The area ① in each chart indicates that continuous operation is allowed by default with the large displacement.
 The area ② indicates that continuous operation is allowed by default with the small displacement.
 Both areas ① and ② can be changed as shown below by adjusting the pump discharge capacity.
 For details, consult us separately.



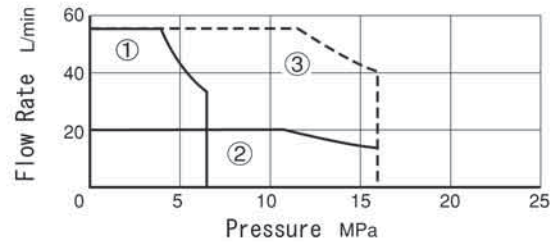
(Note) Since the ASR series employs variable displacement pumps, the pressure and flow rate ranges for continuous operation can be adjusted as shown on the left.

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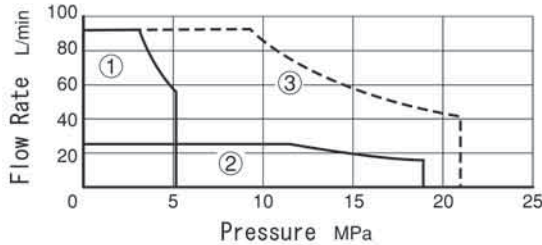
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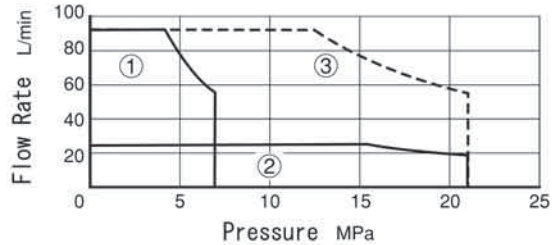
ASR2-*C-CW**00-11



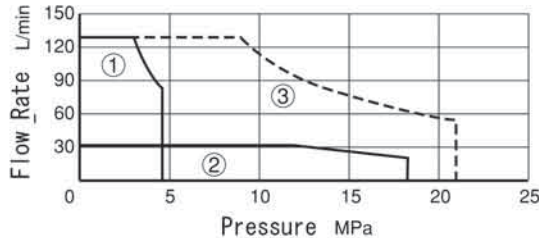
ASR3-*E-HW**00-11



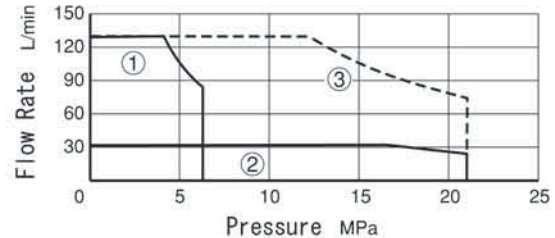
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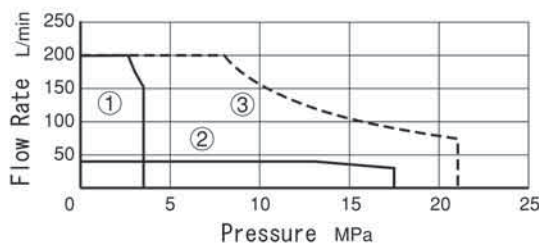
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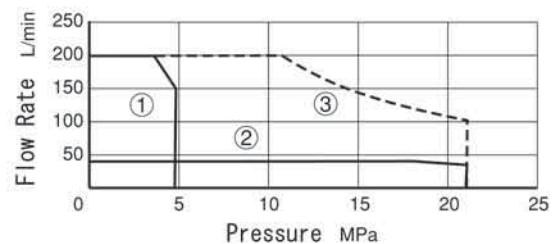
ASR5-*J-HW**00-11



ASR10-*J-HW**00-11

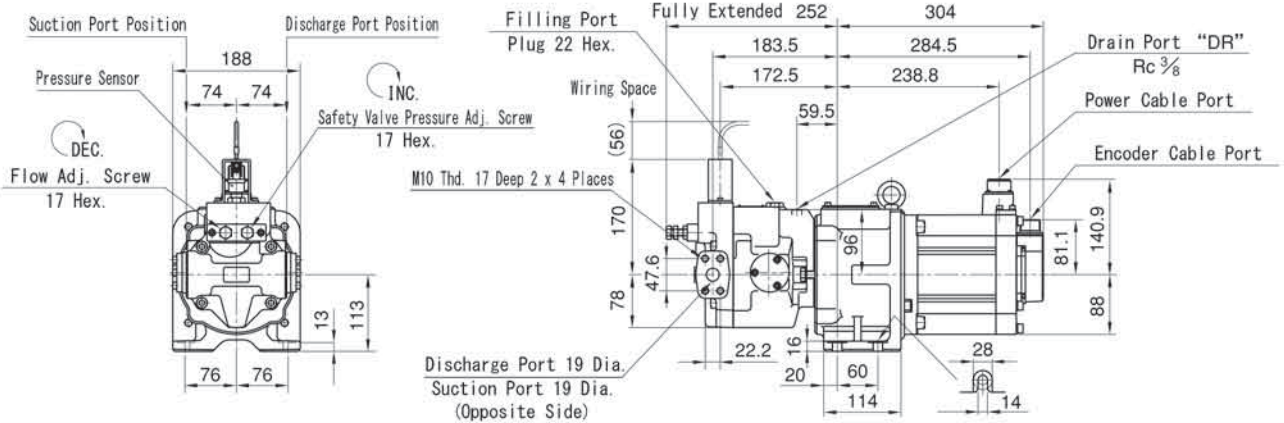


ASR10-*M-HW**00-11

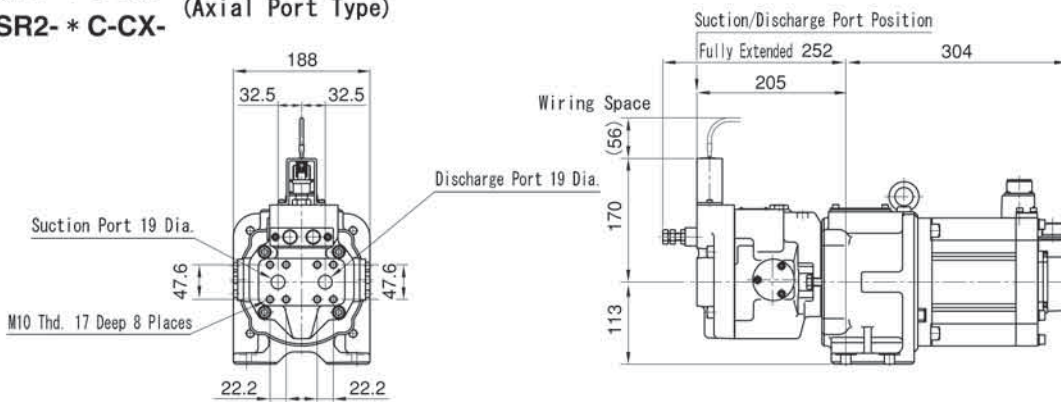


ASR1- * C-HXS- (Side Port Type)
ASR2- * C-CXS-

Single Displacement Type



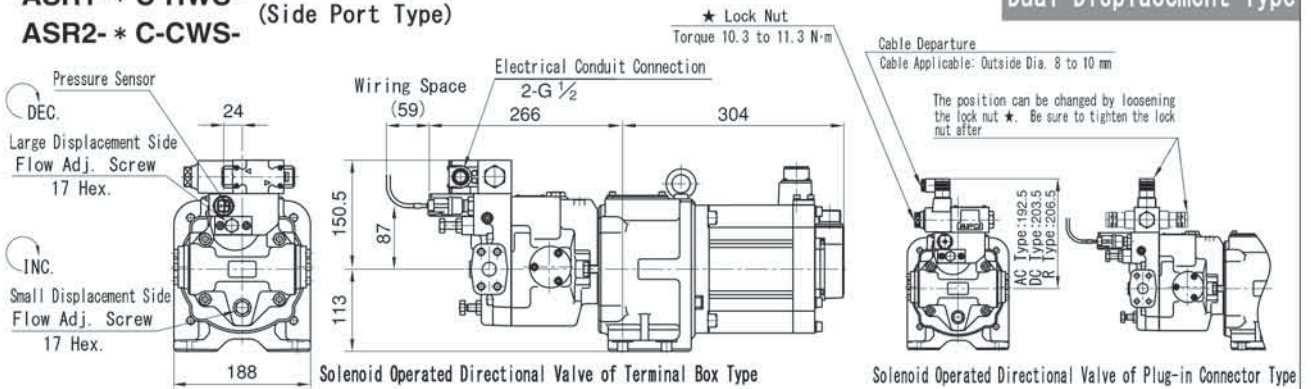
ASR1- * C-HX- (Axial Port Type)
ASR2- * C-CX-



● For other dimensions, see the figure for the side port type.

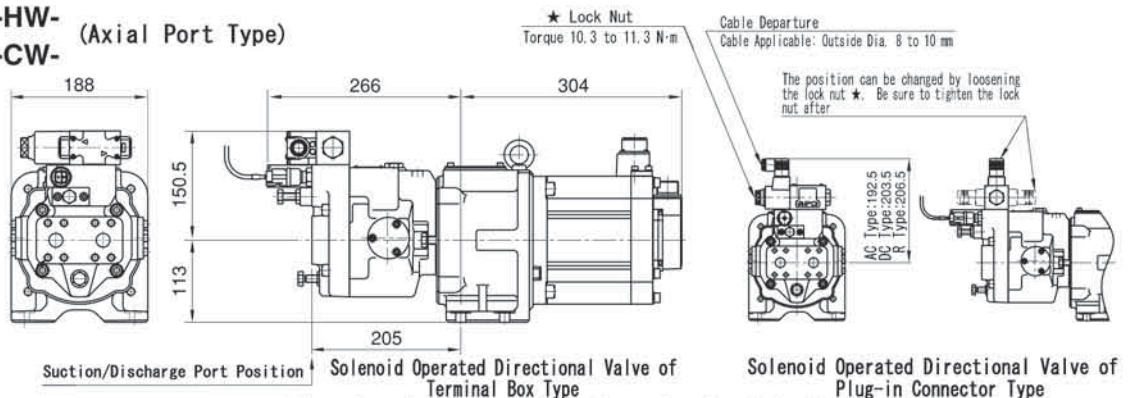
ASR1- * C-HWS- (Side Port Type)
ASR2- * C-CWS-

Dual Displacement Type



● For other dimensions, see the figure for the single displacement type.

ASR1- * C-HW- (Axial Port Type)
ASR2- * C-CW-

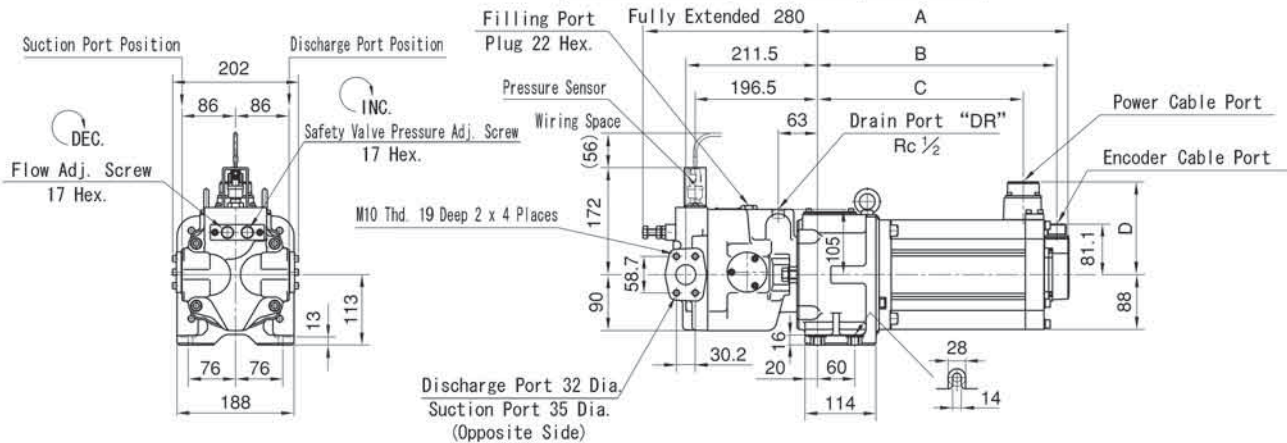


● For other dimensions, see the figure for the single displacement type.

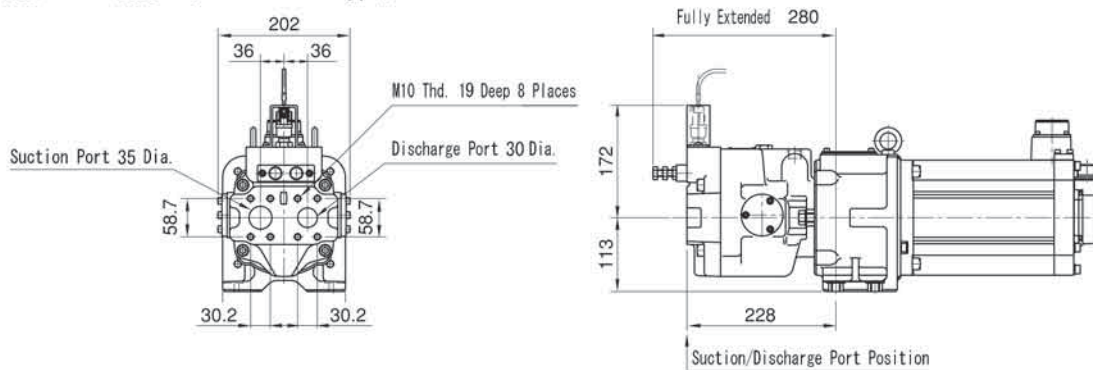
ASR3--HXS- (Side Port Type)**

Model Numbers	A	B	C	D
ASR3-E-H*S-	364	344.5	290.8	149.1
ASR3-*G-H*S-	404	384.5	330.8	149.1

Single Displacement Type



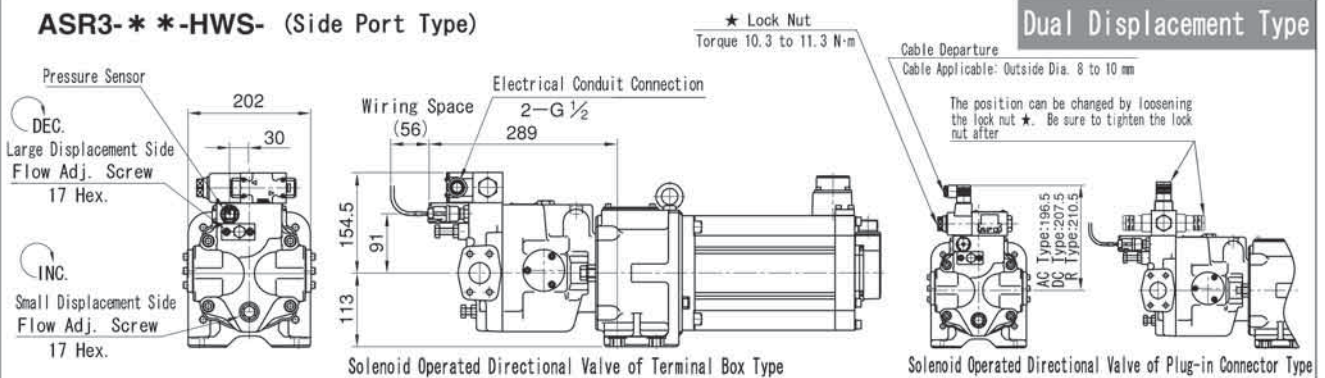
ASR3--HX- (Axial Port Type)**



● For other dimensions, see the figure for the side port type.

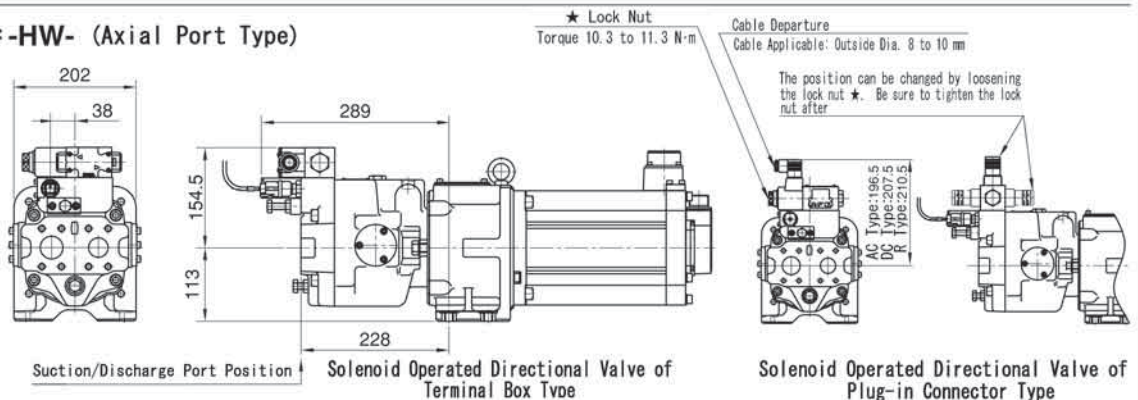
ASR3--HWS- (Side Port Type)**

Dual Displacement Type



● For other dimensions, see the figure for the single displacement type.

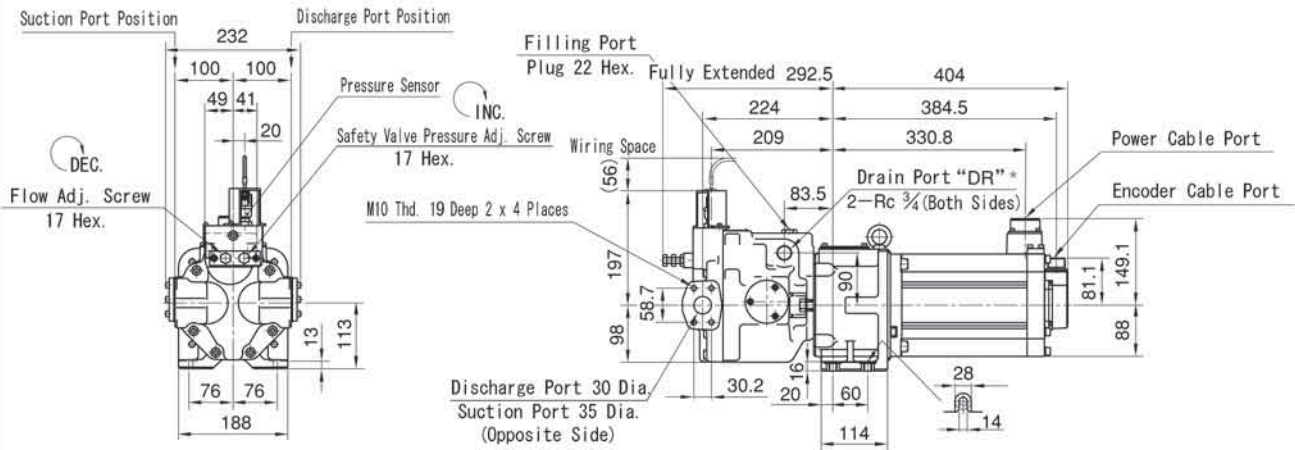
ASR3--HW- (Axial Port Type)**



● For other dimensions, see the figure for the single displacement type.

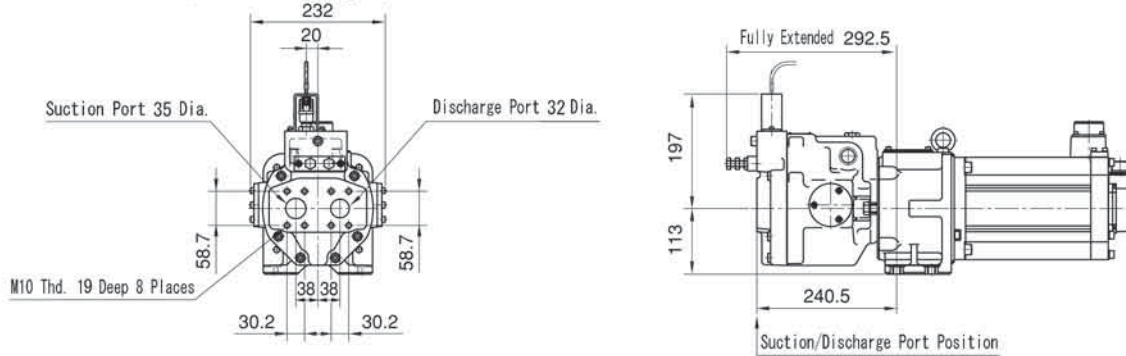
ASR5- * G-HXS- (Side Port Type)

Single Displacement Type



★ Use either of two drain ports at your option. Keep the unused port plugged.

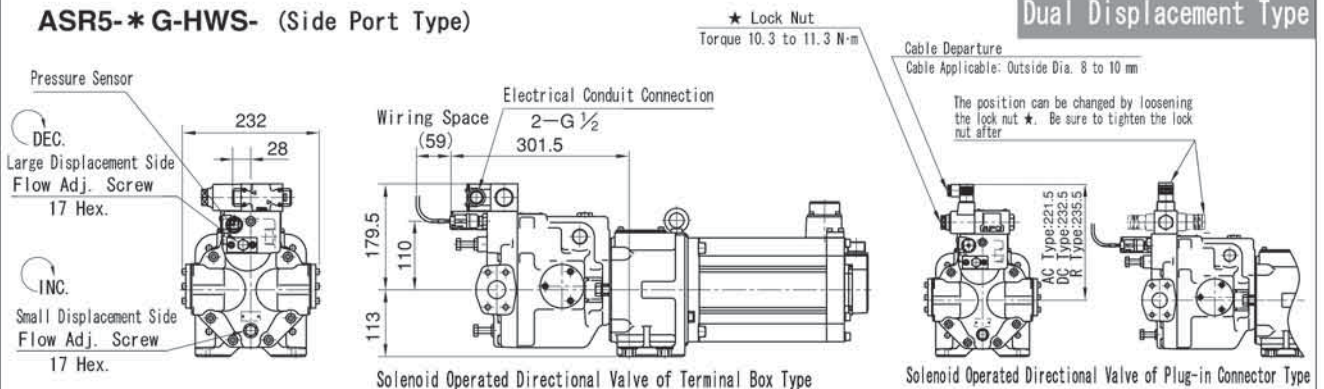
ASR5- * G-HX- (Axial Port Type)



● For other dimensions, see the figure for the side port type.

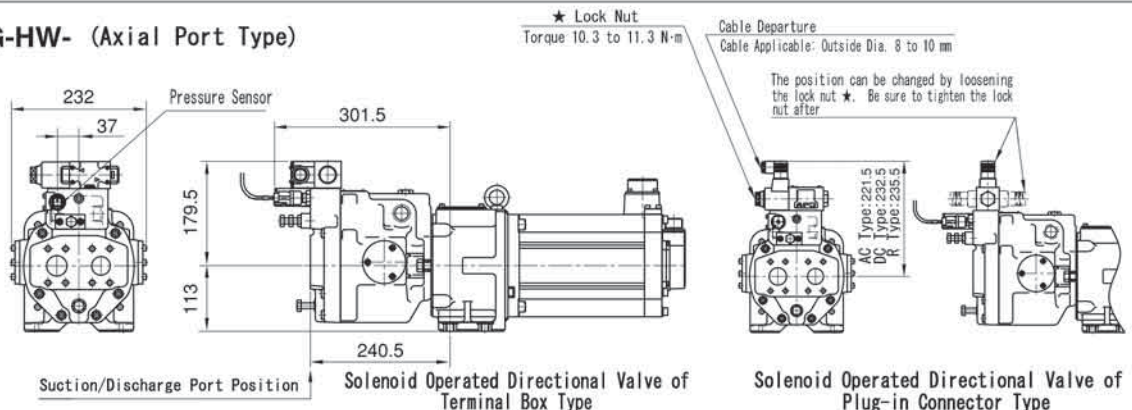
ASR5- * G-HWS- (Side Port Type)

Dual Displacement Type



● For other dimensions, see the figure for the single displacement type.

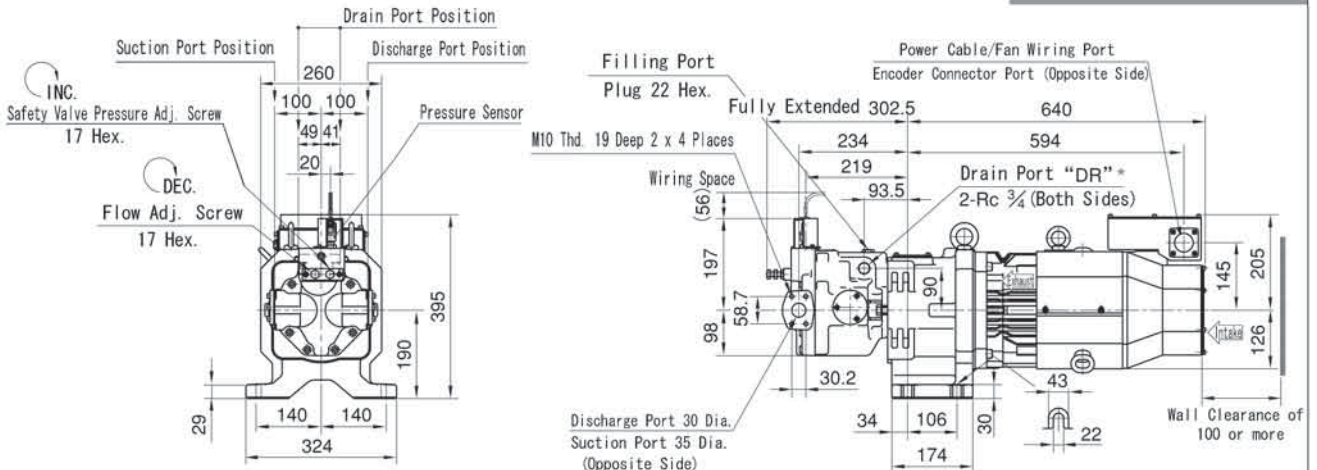
ASR5- * G-HW- (Axial Port Type)



● For other dimensions, see the figure for the single displacement type.

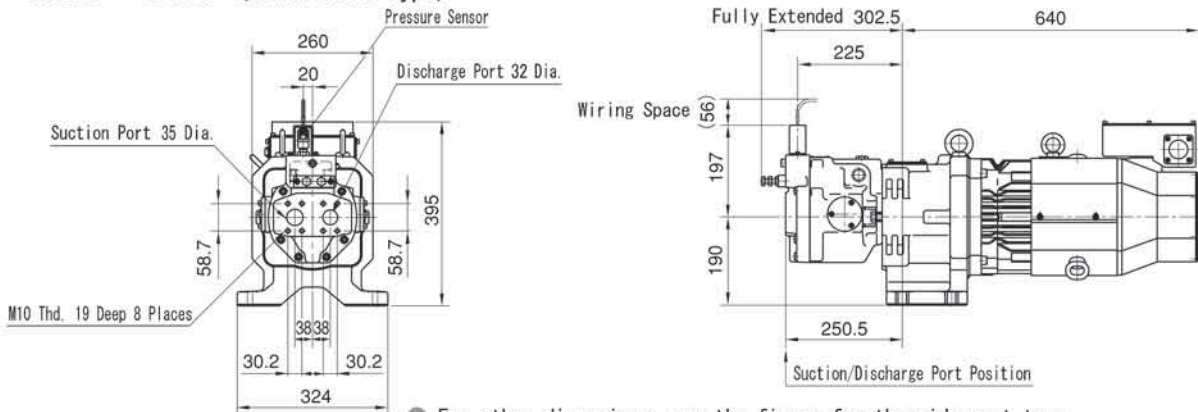
ASR5- * J-HXS- (Side Port Type)

Single Displacement Type



★ Use either of two drain ports at your option. Keep the unused port plugged.

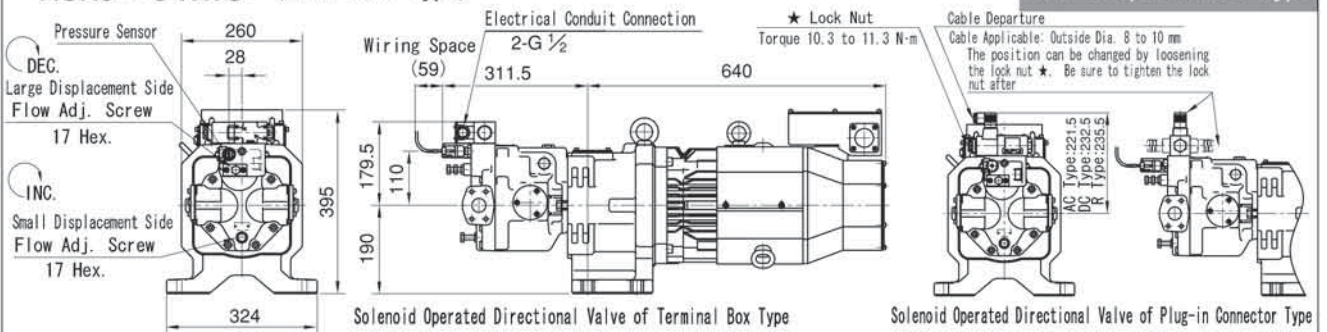
ASR5- * J-HX- (Axial Port Type)



● For other dimensions, see the figure for the side port type.

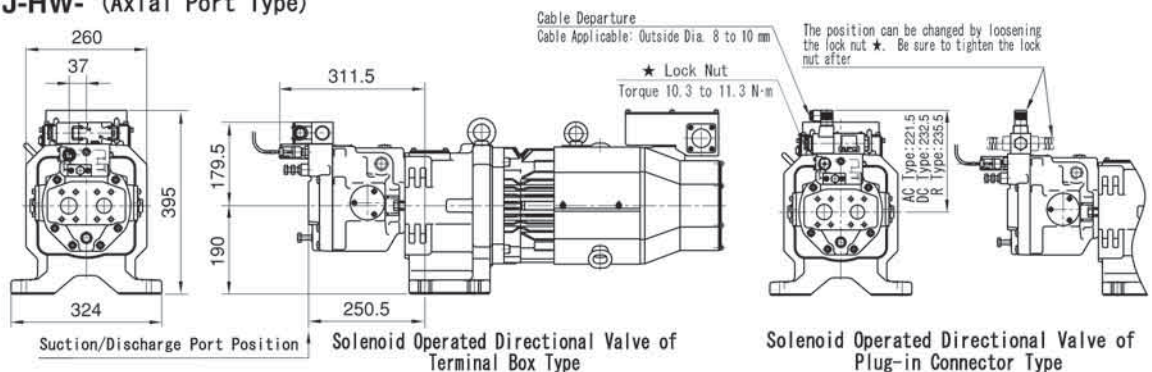
ASR5- * J-HWS- (Side Port Type)

Dual Displacement Type



● For other dimensions, see the figure for the single displacement type.

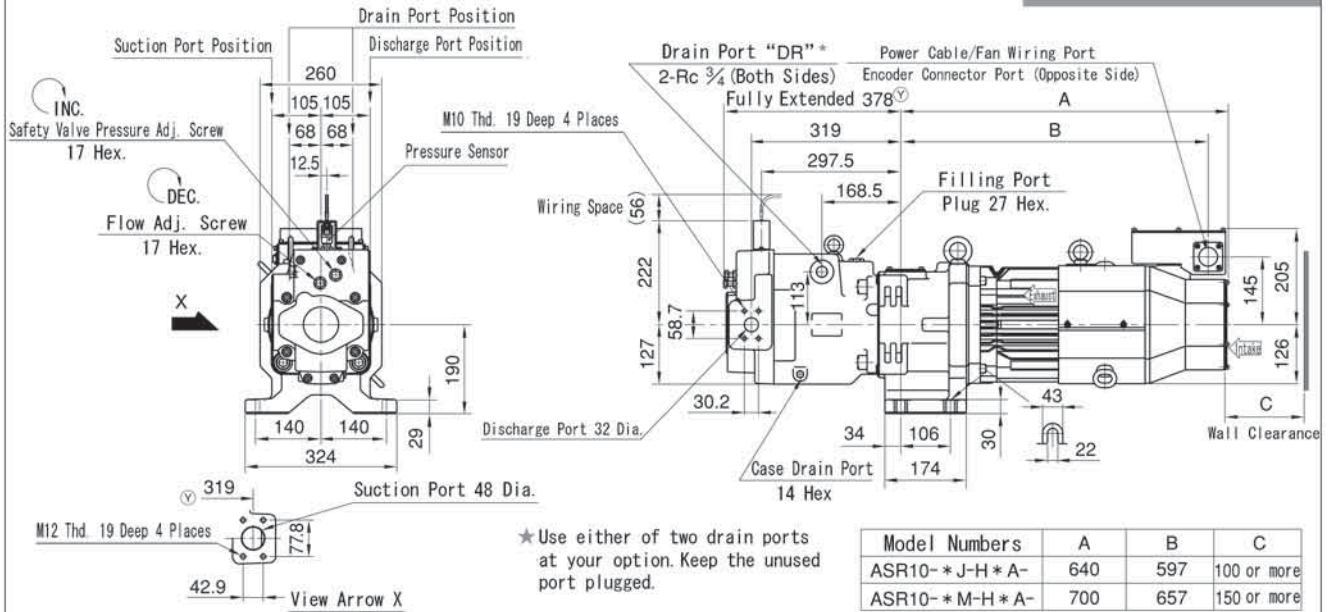
ASR5- * J-HW- (Axial Port Type)



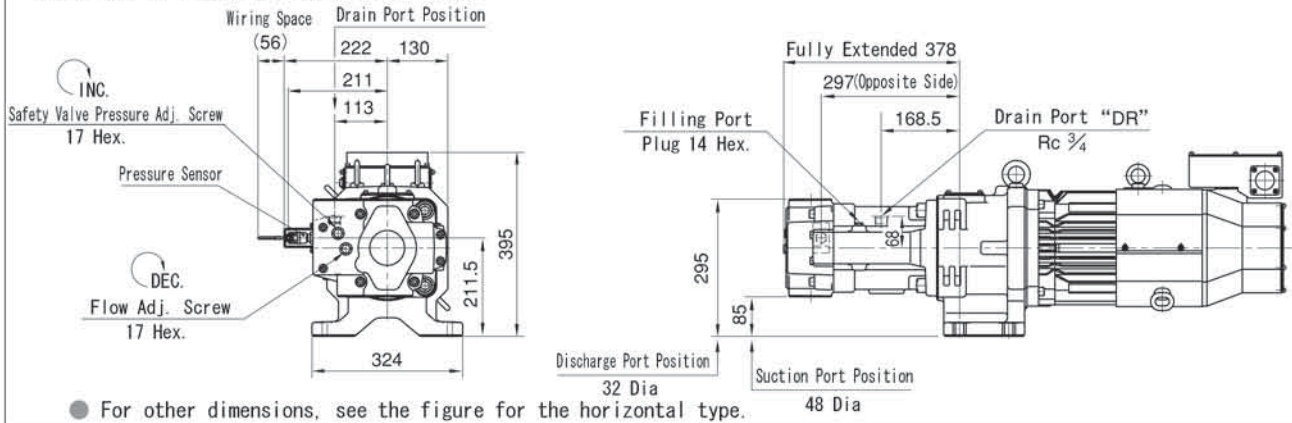
● For other dimensions, see the figure for the single displacement type.

ASR10--HXA- (Horizontal Type)**

Single Displacement Type

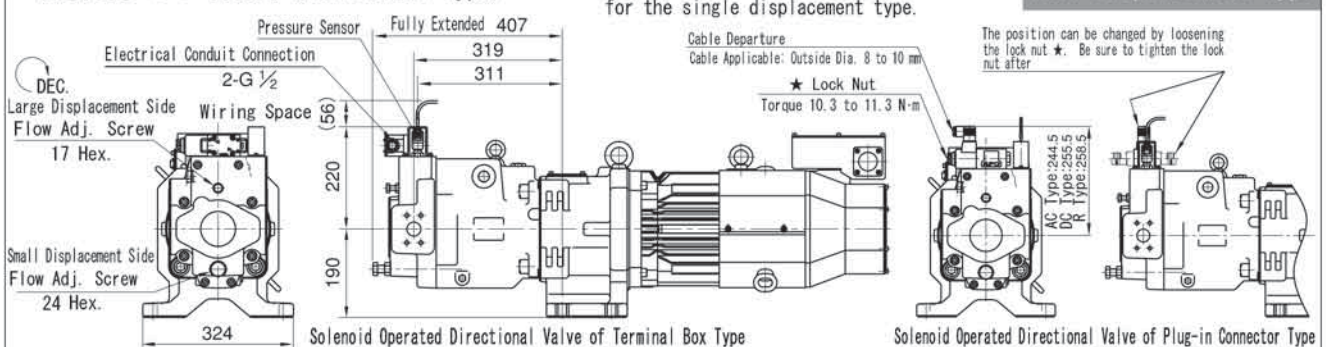


ASR10--HXB- (Vertical Type)**

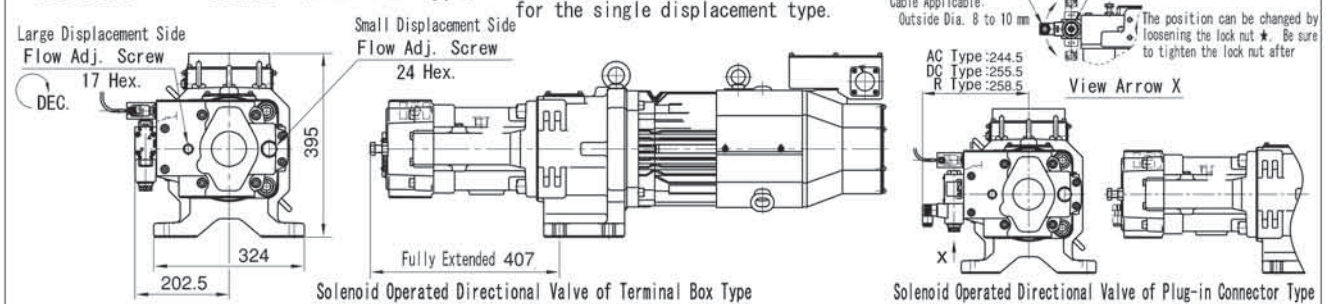


ASR10--HWA- (Horizontal Type)**

Dual Displacement Type



ASR10--HWB- (Vertical Type)**



AMSR Controller

The AMSR controller drives ASR series AC servo motor driven pumps. Optimally designed to drive the ASR pumps, the controller maximizes the pump performance. The AMSR controller is included with the ASR pumps.



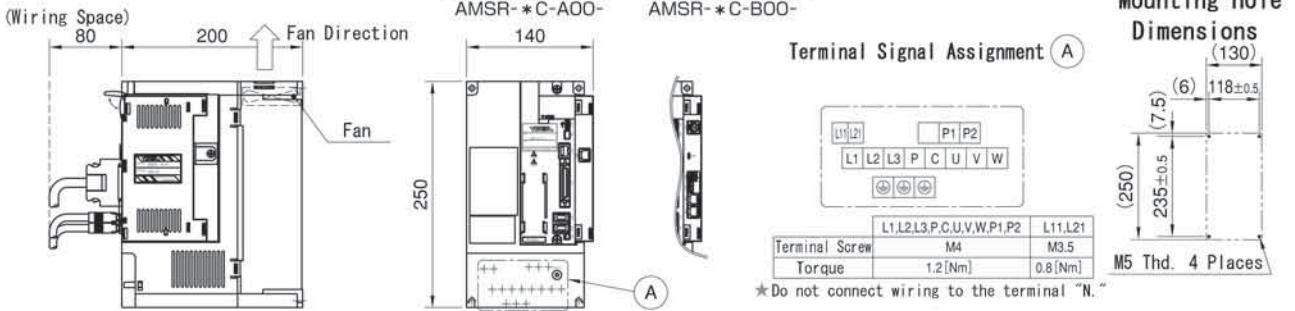
Specifications

Model Numbers		AMSR- *C- *00-10	AMSR-2DE- *00-10	AMSR- *FGI- *00-10	AMSR- *HJL- *00-10	AMSR- *KMO- *00-10
Control Unit Specifications	Command Signal Input Voltage	0 to + 10 V DC				
	Command Signal Input Impedance	10 kΩ				
	Monitor Output Voltage	0 to + 10 V DC				
	Sequence Input Signal	Photocoupler Input 8ch				
	Sequence Output Signal	Open Collector Output 6ch				
Main Circuit Power	Voltage/Frequency	200 V	AC 200 to 230 V, 50/60 Hz, 3-Phase			
		400 V	AC 380 to 480 V, 50/60 Hz, 3-Phase			
	Permissible Voltage Fluctuation	200 V	AC 170 to 253 V, 3-Phase			
		400 V	AC 323 to 528 V, 3-Phase			
Permissible Frequency Fluctuation	Within 5 %					
Power Supply Capacity		6.8 kVA	8.6 kVA	12 kVA	16 kVA	22 kVA
DB (Dynamic Brake)		Built-in		External Option		
Cooling System		Fan-cooling, Open (IP00)				
Environmental Condition	Ambient Temperature	0 to + 50 °C (No Freezing)				
	Ambient Humidity	90 % RH or less (No Condensation)				
Protective Functions		<ul style="list-style-type: none"> • Overcurrent Shutdown • Servo Motor Overheat Protection • Undervoltage Protection • Excess Error Protection • Regenerative Overvoltage Shutdown • Encoder Malfunction Protection • Instantaneous Power Failure Protection • Overload Shutdown • Regeneration Malfunction Protection • Overspeed Protection 				
Mass kg		4.6	6.2	18		19
Applicable Pump		ASR 1- *C ASR 2- *C	ASR 3-E	ASR 3- *G ASR 5- *G	ASR 5- *J ASR 10- *J	ASR 10- *M

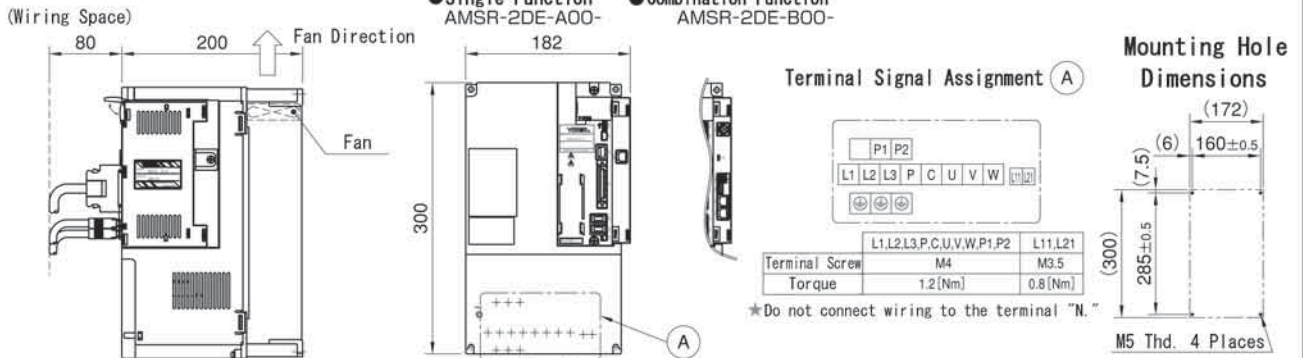
Model Number Designation

AMSR	-2	C	-A	00	-10
Series Numbers	Power Supply Voltage	Amplifier Capacity kW	Function Selection	Parameter Number	Design Number
AMSR : AMSR Controller	2 : AC 200 V	DE : 7.0	A : Single B : Combination (Single Operation Allowed)	00 : Standard	10
	2 : AC 200 V	C : 5.0 FGI : 11.0 HJL : 15.0 KMO : 22.0			
	4 : AC 400 V				

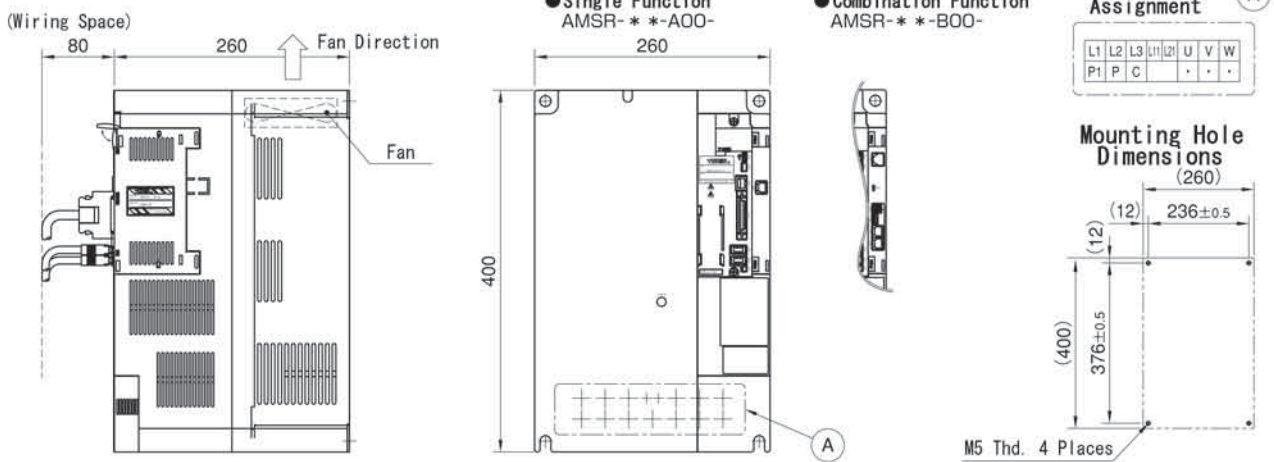
AMSR- * C- * 00-10



AMSR-2DE- * 00-10



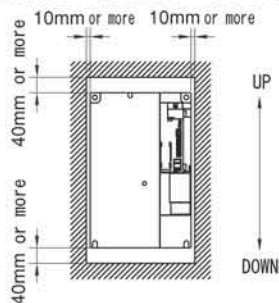
AMSR- * FGI/ * HJL/ * KMO- * 00-10



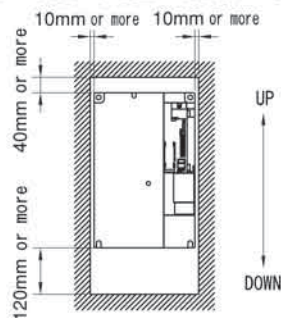
Terminal Symbol	L1~L3, U, V, W, P1, P, C	L11, L12
Terminal Screw Size/ Torque [Nm]	AMSR- * FGI/ * HJL- * 00-10 M6/3.0	M4/1.2
	AMSR- * -KMO- * 00-10 M8/6.0	

Installation Standard

AMSR- * C/2DE- * 00-10



AMSR- * FGI/ * HJL/ * KMO- * 00-10

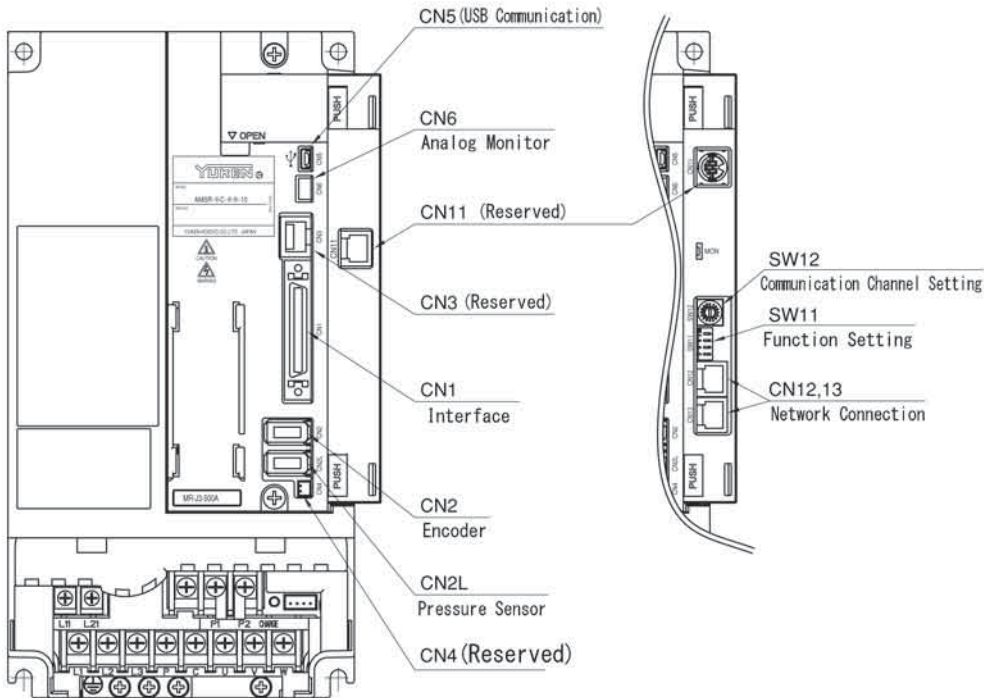


★ Consult us when installing the controller next to the pump.

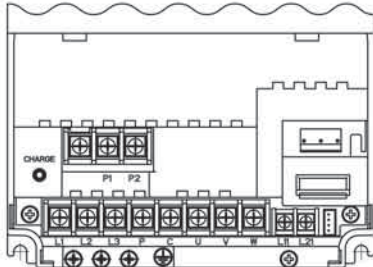
■ Terminal Names/Appearance

● AMSR- *C-A00-
Single Function

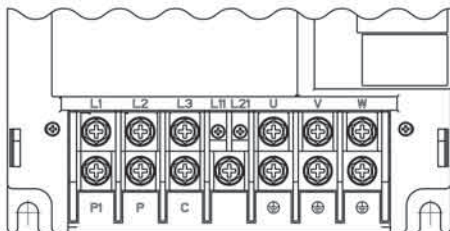
● AMSR- *C-B00-
Combination Function



● AMSR-2DE-



● AMSR- *FGI/ *HJL/ *KMO-



Function	Symbol	Terminal Name	Terminal Channel	Description
Single /Combination	CN5	USB Communication	—	With the USB communication function, servo operation, parameter change, and monitor function can be performed on a PC. Recommended Cable USB Cable: Mini B Type
Combination	SW11	Function Selection	1	For the manufacturer's setting. Always off.
			2	Reserved.
			3	For switching single and combination operations. Off: Combination On: Single
			4	For network termination setting. Off: None On: 150 Ω
Combination	SW12	Communication Channel Selection	0	Master station.
			1 to F	Slave station
Combination	CN12, CN13	Network Connection	—	For connection to the network based on the AMSR controller. Recommended Cable TFL-FST- *S (SANWA) MJ-FS* (ELECOM)

Terminal Block

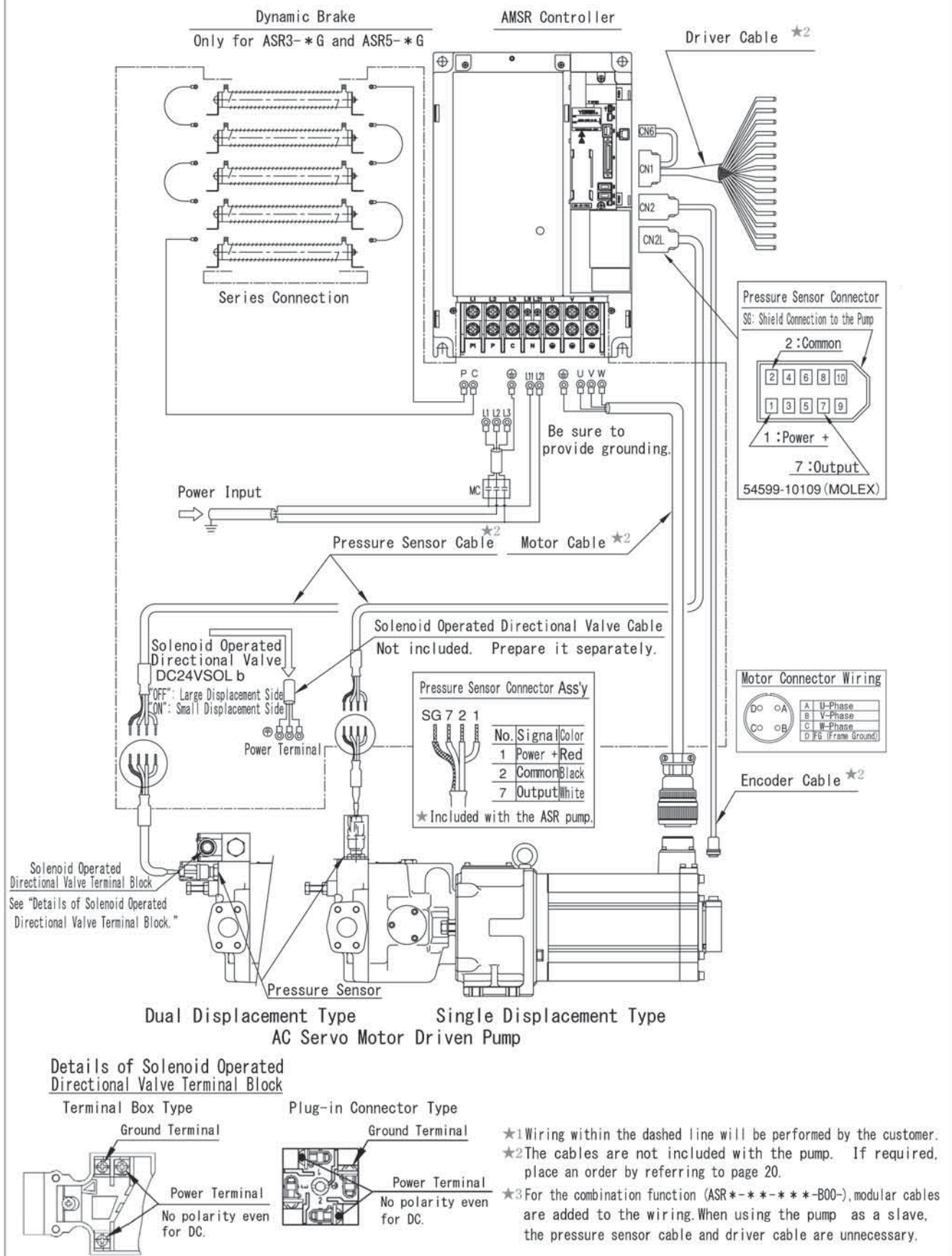
Connection (Use)	Signal Name	Description	
		AMSR-2C/2DE/ 2FGI/2HJL/2KMO	AMSR-4C/4FGI/ 4HJL/4KMO
DC Reactor for Power Factor Improvement	P1	P1 - P2 is short-circuited by default (the DC reactor cannot be used).*1	
	P2		

*1 Contact us when connecting the units.

For the details of CN1, CN2L, and CN6, consult us separately.

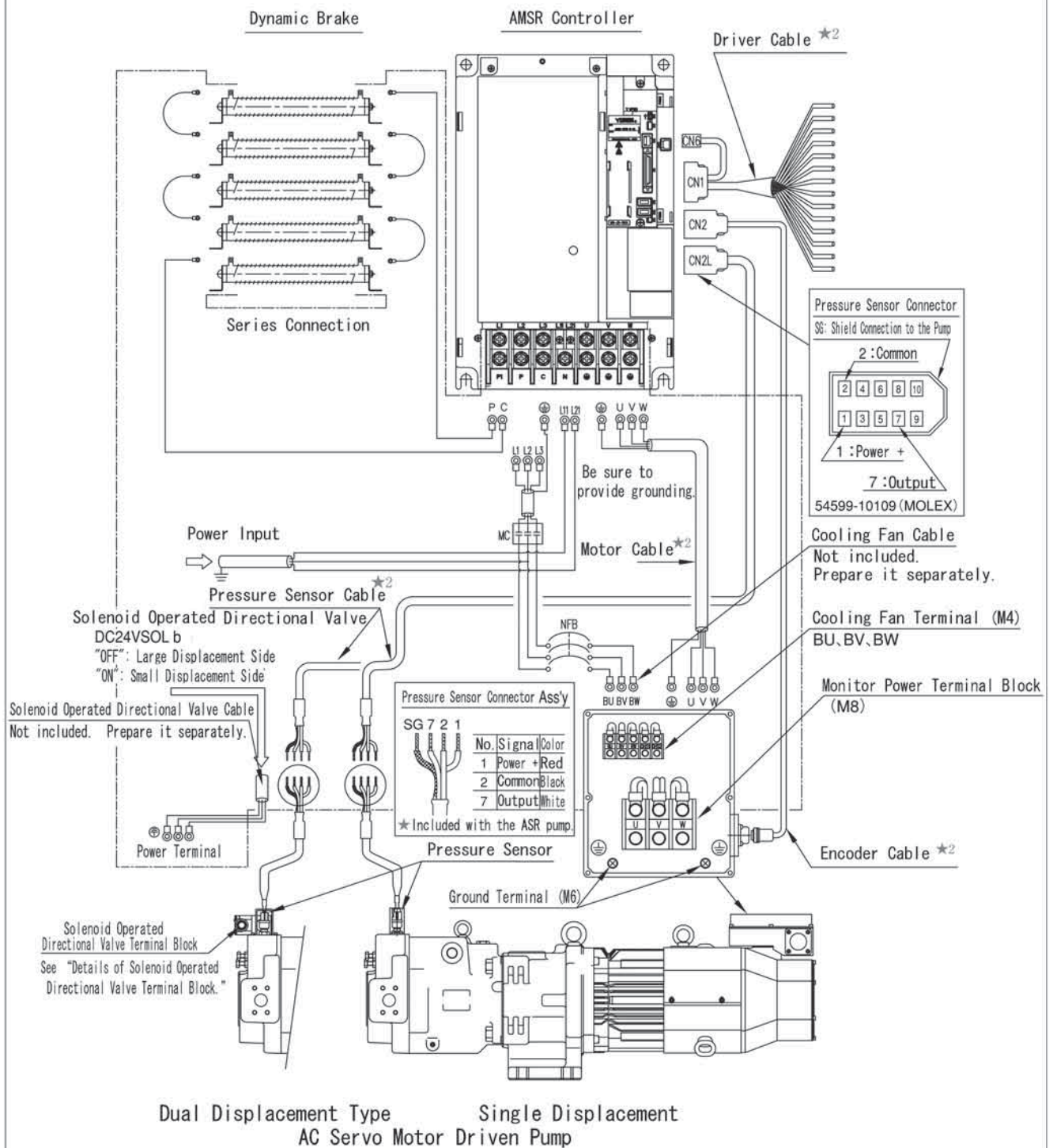
■ Wiring Diagram

ASR1- *C-H* *-A00-11, ASR2- *C-C* *-A00-11
 ASR3-E/ *G-H* *-A00-11, ASR5- *G-H* *-A00-11

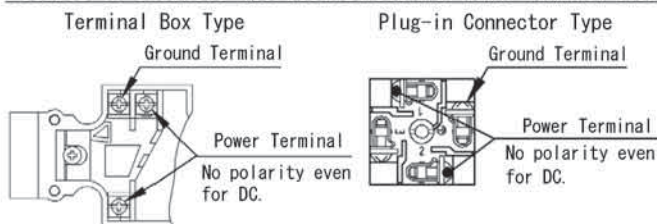


■ **Wiring Diagram**

ASR5- *J-H* S-A00-11, ASR10- *J/M-H* S-A00-11



Details of Solenoid Operated Directional Valve Terminal Block



- ★1 Wiring within the dashed line will be performed by the customer.
- ★2 The cables are not included with the pump. If required, place an order by referring to page 20.
- ★3 For the combination function (ASR***-***-B00-), modular cables are added to the wiring. When using the pump as a slave, the pressure sensor cable and driver cable are unnecessary.

Connectors

	CN1	CN2L	CN6
Housing	10150-3000VE(3M)	54599-1019 (MOLEX)	51004-0300(MOLEX)
Terminal	—		—
Case	10350-52F0-008(3M)	—	50011-8100(MOLEX)
Cable	Core Size	AWG#18 to #28	AWG#24 to #34
	Covered Dia.	Max. 1.6 Dia.	0.8 to 1.4 Dia.
	Strip Length	1.5 to 2.4 mm	1.2 to 2.0 mm

Motor Cable Plug/Cable Clamp

Model Numbers	Motor Cable Plug		Cable Clamp
	Straight	L-shaped	
ASR 1/ASR 2	MS3106B22-22S	MS3108B22-22S	MS3057-12A
ASR 3- * G	MS3106B32-17S	MS3108B32-17S	MS3057-20A

DDK Ltd.

Wiring Types

Common Wiring

Terminals and Cables	Wiring mm ²
L11/L21	1.25(AWG16)*
Pressure Sensor Cable	0.5(AWG20)

Dynamic Brake

Wiring: 5.5mm² (AWG10)*

Power Classification

Electric Source	Model Numbers	Wiring mm ²	
		Power Input L1, L2, L3*	Motor Cable U, V, W*
AC 200 V 3-Phase	ASR1/ASR2/ASR3-C	5.5 (AWG10)	5.5 (AWG10)
	ASR3-E	8 (AWG8)	8 (AWG8)
	ASR3/ASR5-G	14 (AWG6)	14 (AWG6)
	ASR5/ASR10-J	22 (AWG4)	22 (AWG4)
AC 400 V 3-Phase	ASR10-M	50 (AWG1/0)	30 (AWG2)
	ASR1/ASR2/ASR3-4C	5.5 (AWG10)	5.5 (AWG10)
	ASR3/ASR5-4G	8 (AWG8)	8 (AWG8)
	ASR5/ASR10-4J	14 (AWG6)	8 (AWG8)
	ASR10-4M	14 (AWG6)	22 (AWG4)

* Use a 600 V vinyl-insulated cable.

Cable Numbers

The cables are not included with the ASR pumps. If required, place an order by referring to the list below. The cables other than the motor cable are common for all models.

Motor Cable

ASR Pump Model Numbers	Cable Model Numbers	Remarks
ASR 1- * C- HX * - * 00-11	YSDC-M1-29-☆-★-10	☆: Plug Type S: Straight L: L-shaped ★: Cable Length 03: 3 m 05: 5 m 10: 10 m 15: 15 m 20: 20 m 30: 30 m N: Plug and cable clamp only
ASR 2- * C- CX * - * 00-11		
ASR 3-E- HX * - * 00-11	YSDC-M1-44S-☆-★-10	
ASR 3-G- HX * - * 00-11	YSDC-M1-1A-☆-★-10	
ASR 3-4G- HX * - * 00-11	YSDC-M1-44S-☆-★-10	
ASR 5-G- HX * - * 00-11	YSDC-M1-1A-☆-★-10	
ASR 5-4G- HX * - * 00-11	YSDC-M1-44S-☆-★-10	

Driver Cable/Encoder Cable/Pressure Sensor Cable

Cable Type	Cable Model Numbers	Remarks
Driver Cable	YSDC-D14-00-★-10	★: Cable Length 01: 1 m 02: 2 m 03: 3 m 05: 5 m 10: 10 m 20: 20 m
Encoder Cable	YSDC-E7-S-★-10	★: Cable Length 02: 2 m 05: 5 m 10: 10 m
Pressure Sensor Cable	Consult us separately.	

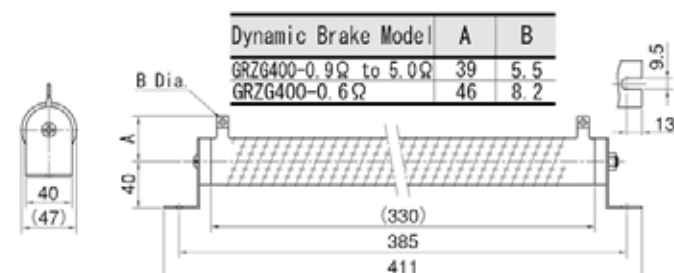
Dynamic Brake

Specifications

AMSR Controller Model Numbers	Dynamic Brake Model	Qty.	Permissible Regeneration W	Regeneration with Fan W	Resistance Ω	Mass kg
AMSR-2FGI-	GRZG400-1.5Ω	4	500	800	6 (1.5Ω×4)	3.2 (0.8kg×4)
AMSR-2HJL-	GRZG400-0.9Ω	5	850	1300	4.5 (0.9Ω×5)	4.0 (0.8kg×5)
AMSR-2KMC-	GRZG400-0.6Ω				3 (0.6Ω×5)	
AMSR-4FGI-	GRZG400-5.0Ω	4	500	800	20 (5.0Ω×4)	3.2 (0.8kg×4)
AMSR-4HIL-	GRZG400-2.5Ω	5	850	1300	12.5 (2.5Ω×5)	4.0 (0.8kg×5)
AMSR-4KMC-	GRZG400-2.0Ω				10 (2.0Ω×5)	

★1. Dynamic brakes are included with the ASR pumps.

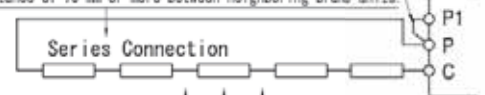
★2. Dynamic brakes may become excessively heated. Use heat-resistant and fireproof wires and avoid their contact with the brakes.



Connection

Do not disconnect the connector bar.

Keep a distance of 70 mm or more between neighboring brake units.



Fan (1.0m³/min, □92×2 units)*

★ Recommended fan capacity for fan cooling. In this case, change the setting of parameter No. PA02 from "0000" to "00FA."

“F5” Series Pipe Flange Kits

4 Bolt Solid Flanges (SAE)

The dimensions of the flange mounting surface are based upon SAE 4 Bolt Split Flange (Standard Pressure Series).

Model Number Designation

F5	—06	—A	—10
Series Number	Flange Size	Type of Pipe Connection	Design Number
F5	Refer to below table	A : Threaded Connection B : Socket Welding C : Butt Welding	10

F5- *-A

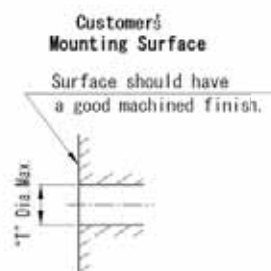
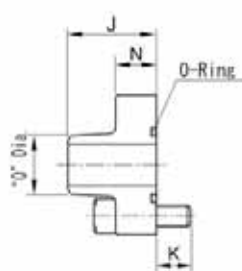
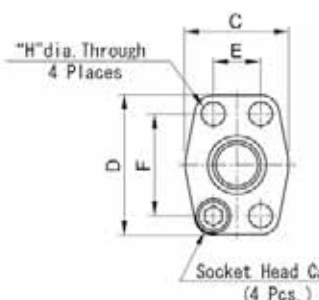
F5- *-B

Customer's Mounting Surface
Surface should have a good machined finished.

Kit Numbers	Piping Size	Dimension mm											O-Ring	Socket Head Cap Screw (4 Pcs.)	Max. Operating Pressure MPa	Approx. Mass kg	Tightening Torque Nm	
		C	D	E	F	H	J	K	L	N	Q	T					Recommendation	Tolerance
F5-06 -A	3/4	48	65	22.2	47.6	11	30	15	3/4	—	—	19	S0-NB-G30	M10 × 40 Lg.	28	0.7	68.5	±10%
F5-06 -B		—	—	—	—	—	—	—	—	12	27.7	—						
F5-10 -A	1 1/4	64	80	30.2	58.7	11	38	17	1 1/4	—	—	32	S0-NB-G40	M10 × 55 Lg.	28	1.2	68.5	
F5-10 -B		—	—	—	—	—	—	—	—	16	43.2	—						
F5-16 -A	2	85	102	42.9	77.8	13.5	38	17	2	—	—	51	S0-NB-G65	M12 × 55 Lg.	17.5	1.7	118	
F5-16 -B		—	—	—	—	—	—	—	—	20	61.1	—						

★1. Approx. mass is the value including socket head cap screws (4Pcs.).
 ★2. The values of tightening torque above apply to when these flanges are used for pressure line.

F5- *-C



Kit Numbers	Piping Size	Dimensions: mm										O-Ring	Socket Head Cap Screw (4 Pcs.)	Max. Operating Pressure MPa	Approx. Mass Kg.	Tightening Torque Nm ^{★1}	
		C	D	E	F	H	J	K	N	Q	T					Recommendation	Tolerance
F5-06-C	3/4	48	65	22.2	47.6	11	41	16	19	27.2	19	S0-NB-G30	M10×35	28	0.35	68.5	±10%
F5-10-C	1 1/4	64	80	30.2	58.7	11	44	16	19	42.7	32	S0-NB-G40	M10×35	28	0.63	68.5	
F5-16-C	2	85	102	42.9	77.8	13.5	50	18	22	60.5	51	S0-NB-G65	M12×40	17.5	1.3	118	

- ★1. Approx. mass is the value including socket head cap screws (4Pcs.).
- ★2. The Values of tightening torque above apply to when these flanges are used for pressure line.

Air Bleed Valves

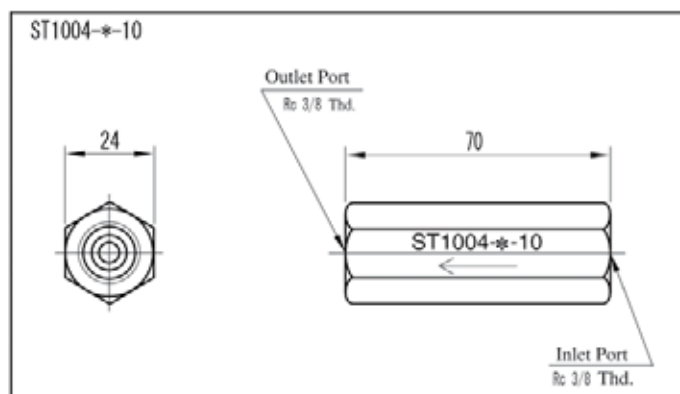
These air bleed valves are designed to use, at the start-up of the pumps, to bleed off the air enclosed in the suction line or the other lines in the system.

Specifications

Model Numbers	ST1004-5-10	ST1004-10-10
Description		
Max. Operating Pressure	25 MPa	
Reseating Pressure	0.15 MPa	
Cracking Pressure	0.34 MPa	
Flow Rate to Reseating	5 L/min	10 L/min
Range of Usage to Pump Output Flow	For 20 to 75 L/min	For Over 75 L/min



Graphic Symbol



Memo

Memo

Memo

AC Servo Motor Driven Pumps Catalogue

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