

Intelligent Hydraulic Servo Drive Pack

The IH (intelligent hydraulic) servo drive pack is a compact energy-saving and low-noise hydraulic device which is combined as one with the AC servo motor, bidirectional rotation piston pump, reservoir and hydraulic control circuit. This combination can control the number of revolutions of the servo motor and adjust the discharge and pressure of the pump. This device can be combined with the sensor – equipped cylinder and dedicated controller to facilitate the configuration of a position, speed and pressure control system.

● Energy Saving

The operation at the number of revolutions meeting the machine requirements (flow rate and pressure) reduces useless power losses and provides energy savings.

Furthermore, by using bidirectional rotation pump, need no directional control valves, so can minimize pressure loss.

● Low Noise

During pressure control, the pump rotation compensating for the internal leakage of oil pressure provides low revolutions with almost no noise.

During flow control, the number of revolutions meeting the machine requirements ensures lower noise generation than conventional devices.

● Compact

A substantial reduction in heat generation enables the operation with a minimum amount of fluid oil for cylinder operation in addition something extra oil. This results in a combination of the servo motor, piston pump, reservoir and hydraulic control circuit in one, providing energy savings. Incorporation into an integral part of the machine is also possible.

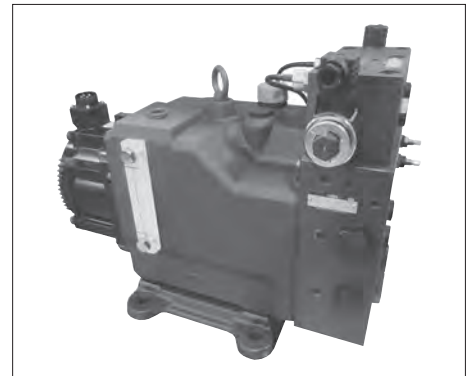
● Digital Control

Software control of the dedicated controller allows a system to have a great deal of versatility.

Digital control parameter setting facilitates to operate the system and its maintenance, furthermore the analog input/output ports provide as standard for user interface.

● Optional Circuit Support

As for the option of tare load circuit, it is possible to built-in counterbalance valve and shut-off valve. (only for YSD2 type and YSD3 type)



■ Specifications

Model Numbers	Geometric Displacement of Pump cm ³ /rev	Max. Rotational Speed r/min	Thrust Output and Cylinder Bore	Reservoir Capacity cm ³	Oil Level Variations cm ³
YSD1- *-09/13	6, 10	2000 [★]	20 - 30 kN (Cylinder Bore 63)	2500	1500
YSD2- *-24/29/44	6, 10, 16		50 - 60 kN (Cylinder Bore 80)	4200	2500
YSD3- *-55/75	10, 16, 30		100 kN (Cylinder Bore 100)	5800	3500

★There are cases when the max. rotational speed is limited by operating pressure and motor output.

■ Instructions

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48

Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курган (3522)50-90-47
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Ноябрьск (3496)41-32-12

Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саранск (8342)22-96-24
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35

Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Улан-Удэ (3012)59-97-51
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

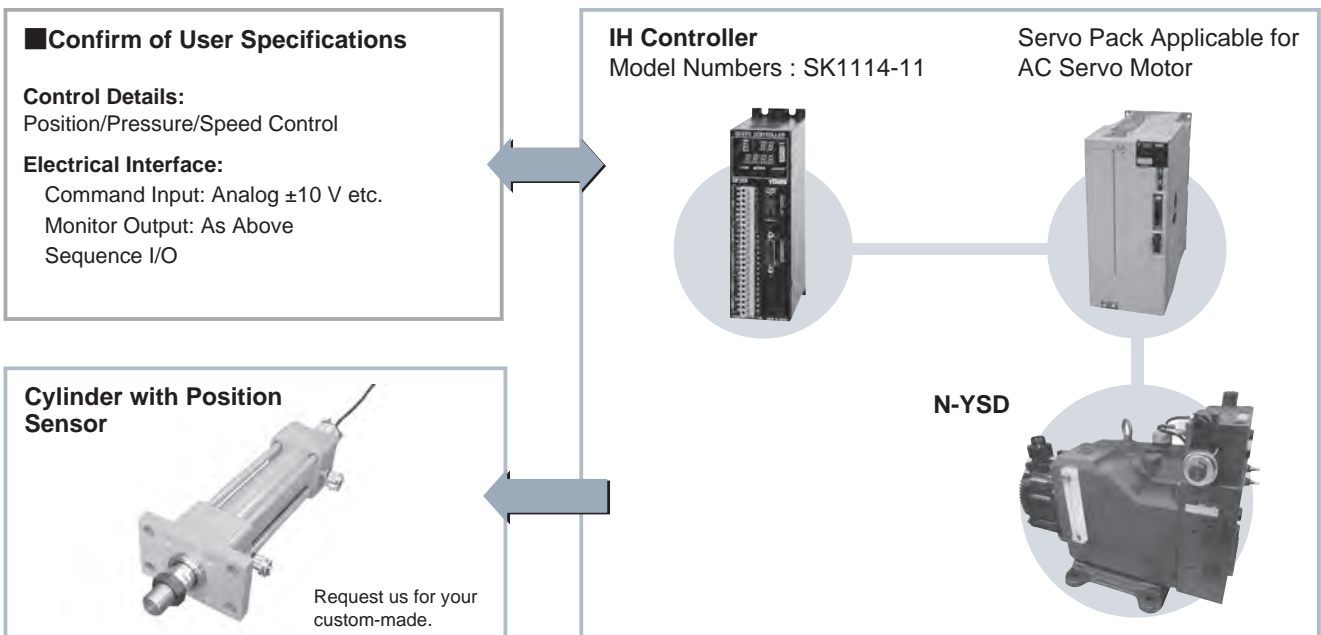
Киргизия +996(312)96-26-47

■ Model Number Designation

N-	YSD3	-F	-55	A	55 ^{★1}	-10	-H	R	-B	A ^{★2}	B ^{★2}	R	-30
Sub Ass'y Code	Series Number	Mtg. Type	Servo Motor Output kW	Direction of servo Motor Connection (Viewed from the Motor End)	Servo Pack kW	Geometric Displacement of Pump cm ³ /rev	Relief Valve Setting Pres. MPa	Pressure Sensor	Option Related				Design Number
									Counterbalance Valve	Pres. Adj. Range of Head Side Counterbalance Valve MPa	Pres. Adj. Range of Rod Side Counterbalance Valve MPa	Shut-off Valve	
N : Pump Motor Sub Ass'y (Omit if not required)	YSD1	F : Flange Mtg. Type B : Bracket Mtg. Type	N1 : Without Servo Motor (For 0.85kW) N2 : Without Servo Motor (For 1.3kW) 09 : 0.85 13 : 1.3	A : Upward B : Downward R : Right L : Left	N : None 09 : 0.85 13 : 1.3	6 : 6 10 : 10	B : 9.5 C : 18.5	H : Head Side R : Rod Side	—	—	—	—	20
	YSD2		N : Without Servo Motor 24 : 2.4 29 : 2.9 44 : 4.4		N : None 24 : 2.4 29 : 2.9 44 : 4.4	6 : 6 10 : 10 16 : 16	B : 9.5 C : 18.5	B : Both Side N : Without Pressure Sensor	H : Head Side R : Rod Side	B : ★3 - 7	H : Head Side R : Rod Side B : Both Side	30	
	YSD3		N : Without Servo Motor 55 : 5.5 75 : 7.5		N : None 55 : 5.5 75 : 7.5	10 : 10 16 : 16 30 : 30	H : 23.5	B : Both Side None : Without Counterbalance Valve	N : ★3 - 1.8 A : 1.8 - 3.5 B : 3.5 - 7	None : Without Shut-off Valve			

- ★1. If pump motor sub ass'y is selected, no need to fill in this item (Not selectable).
- ★2. If select those of without counterbalance valves, this item is none.
- ★3. Please refer to the "Minimum Adj. Pres. Characteristics"(Pages K-66 and K-67).

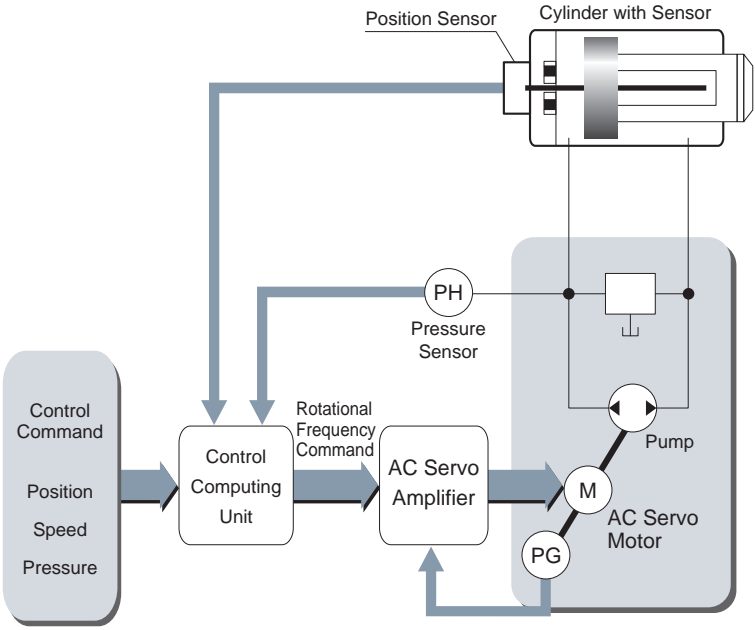
■ System Configuration



Note) Model number 《YSD*》 does not include IH Controller: SK1114-11 and Cylinder with Position Sensor.
If use those equipments, please order separately.

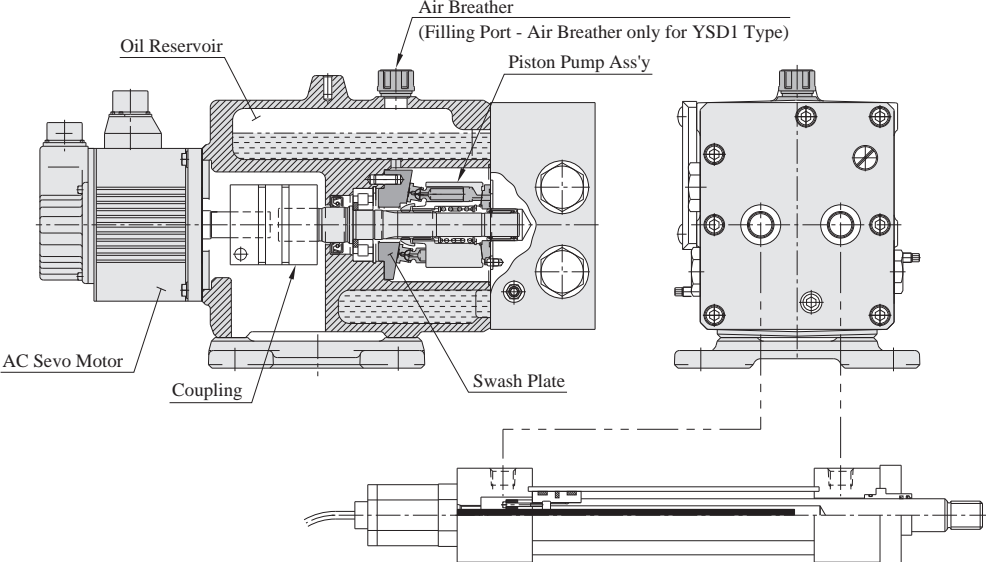
Operation

The bidirectional revolution piston pump is driven by AC servo motor and supply pressured oil to normal or reverse directions. So this is a simple hydraulic circuit only to connect the load cylinder on both output ports. The fluid suction of pump is operated by supplying from cylinder back line and compensation by self-suction valve for excess/efficiency of oil quantity. As of control, provide the control deviation output between upper signal and sensor signal to servo driver (AC servo amplifier), and construct the feedback loop by driving AC servo motor.

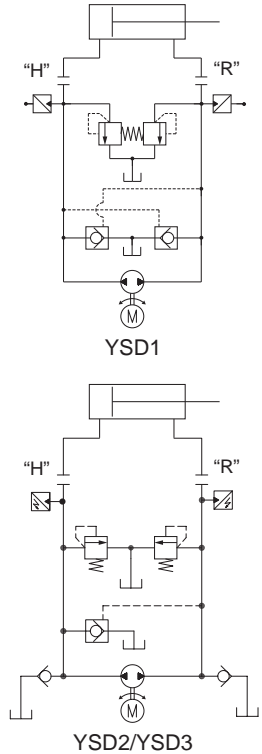


Structure / Hydraulic Circuit

The IH servo drive pack pump is a bidirectional revolution piston pump which offers high performance in a wide range of very low to high revolution. The hydraulic control circuit simply consists of safety valves and self priming valve, without a control valve in the pump discharge line and the series line between cylinders. The reservoir is made compact by using space around the pump. With the oil supply port of hydraulic fluid doubling as an air breather and the side-mounted oil level gauge, the pump is well equipped as a hydraulic driving force.



Hydraulic Circuit



Energy Saving Hydraulic System by Rotational Frequency Control

Energy saving on hydraulic control is achieved by sensing load pressure and control to avoid excess fluid discharge for the required $(Output) = (Pressure) \times (Flow)$. Piston pump generally discharge required flow by changing swash plate degree and control geometric displacement. On the other hand, the rotational frequency control achieves by control rotational speed of motor. That is, $(Flow) = (Rotational Speed) \times (Geometric Displacement of Pump)$. In this case, sensing load pressure by pressure sensor and construct energy saving system by electric feedback control.

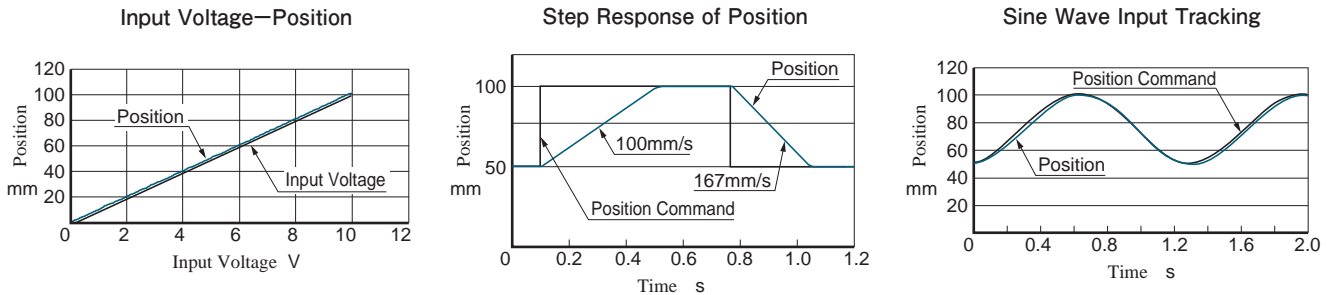
As the conventional way with the pump of high speed fixed rotation, there are some power losses from internal hydraulic drain and low efficiency of induction motor at low load operation. As the rotational frequency control system, the motor rotate on requirement and supply flow, so that is excellent as for energy saving system.

- Example of Standard System Control
- Characteristics Example of The Position and Pressure Control System with IH Servo Drive Pack.

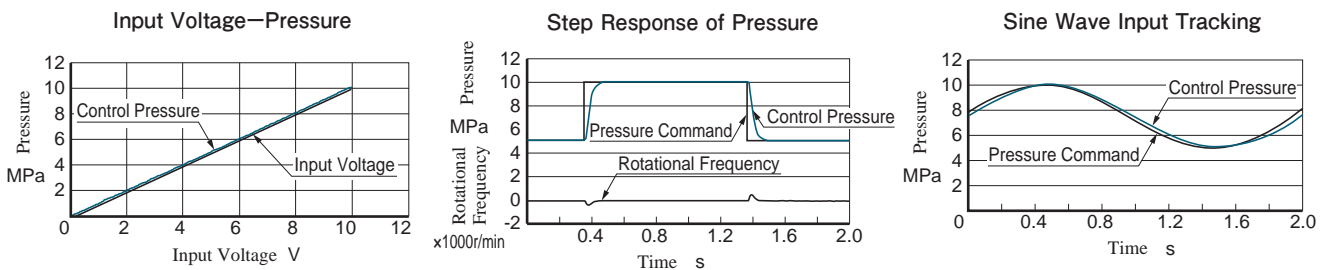
(Note: Control characteristics is different by system, please contact us separately.)

Structure Example : Cylinder 80 Dia. × 45 × 250st Use YSD2-F-44A4-16

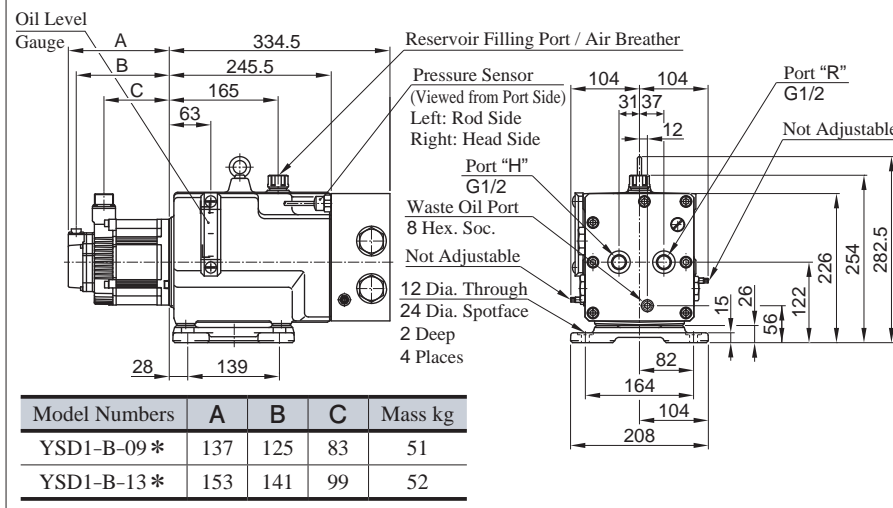
■ Characteristics Example of Position Control



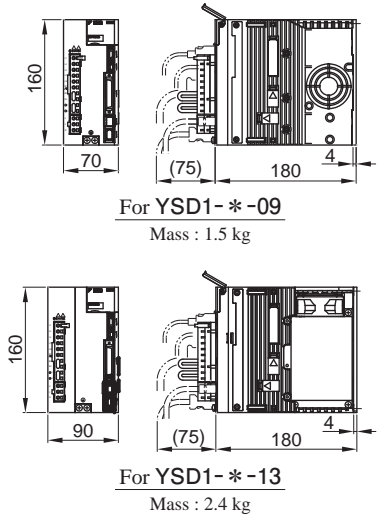
■ Characteristics Example of Pressure Control



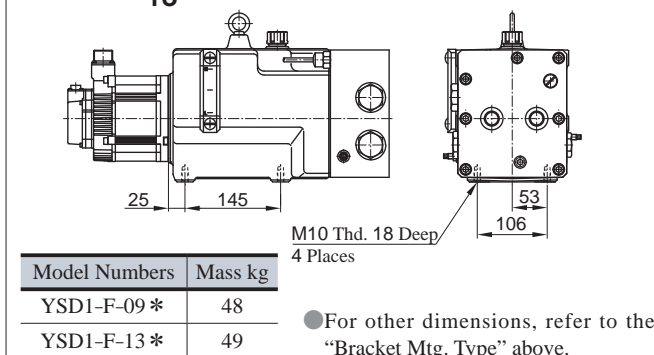
YSD1-B-⁰⁹/₁₃ * * * * *-20 (Bracket Mtg. type)



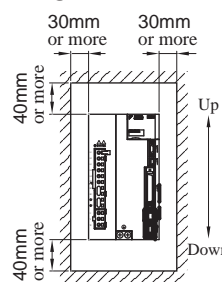
● Servo Pack



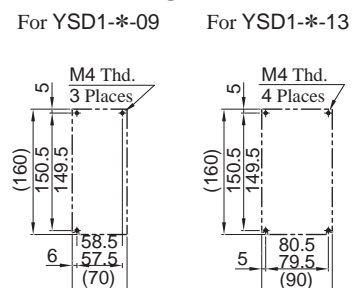
YSD1-F-⁰⁹/₁₃ * * * * *-20 (Flange Mtg. type)



Mtg. Standard

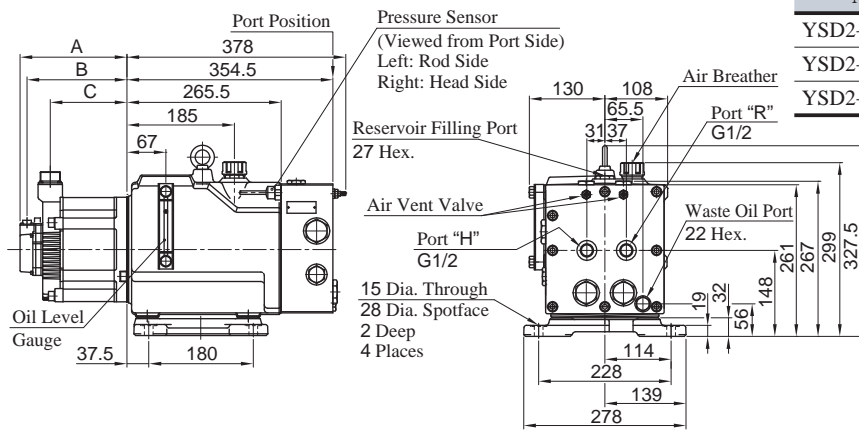


Dimension of Mtg. Hole



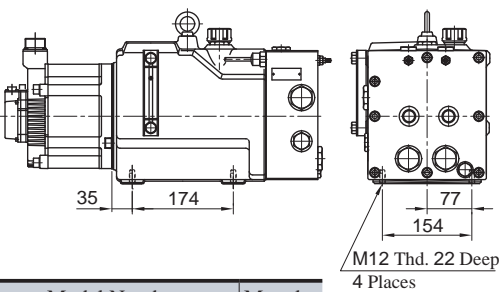
★ If set the servo amplifiers in a row, please contact us separately.

YSD2-B-***-***-30 (Bracket Mtg. type)



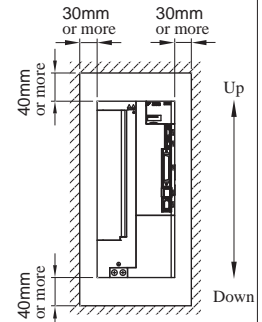
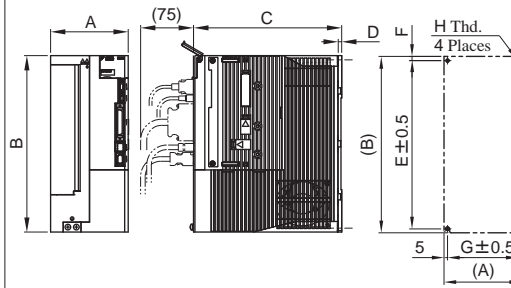
Model Numbers	A	B	C	Mass kg
YSD2-B-24***-***-30	160	148	108	84
YSD2-B-29***-***-30				
YSD2-B-44***-***-30	184	172	132	88

YSD2-F-***-***-30 (Flange Mtg. type)



● Servo Pack For YSD2-**-24 For YSD2-**-29/44

Dimension of Mtg. Hole Mtg. Standard



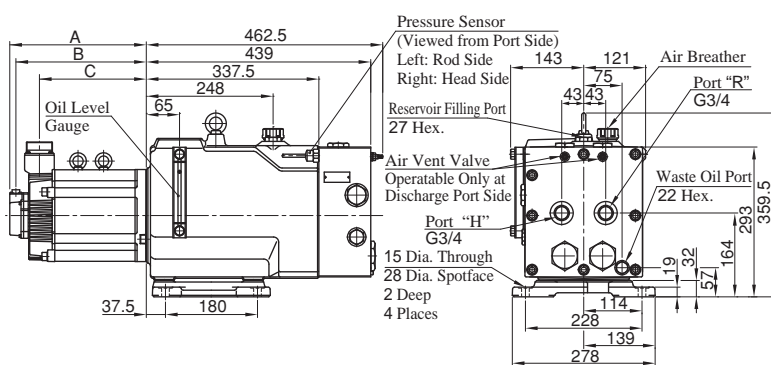
Model Numbers	Mass kg
YSD2-F-24***-***-30	78
YSD2-F-29***-***-30	
YSD2-F-44***-***-30	82

● For other dimensions, refer to the "Bracket Mtg. Type" above.

Type	A	B	C	D	E	F	G	H	Mass kg
For YSD2-**-24	100	180	180	4	170	5	90	M4	2.8
For YSD2-**-29/44	110	250	210	5	238.5	6	100	M5	4.6

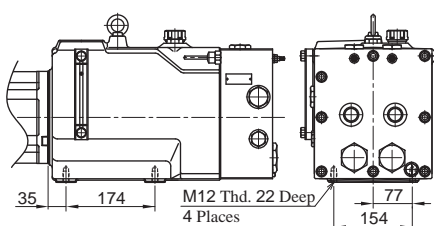
★ If set the servo amplifiers in a row, please contact us separately.

YSD3-B-⁵⁵/₇₅***-***-30 (Bracket Mtg. type)



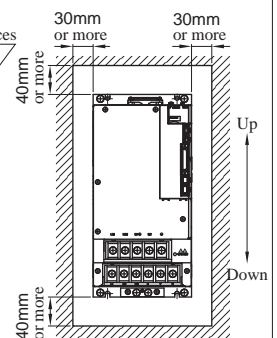
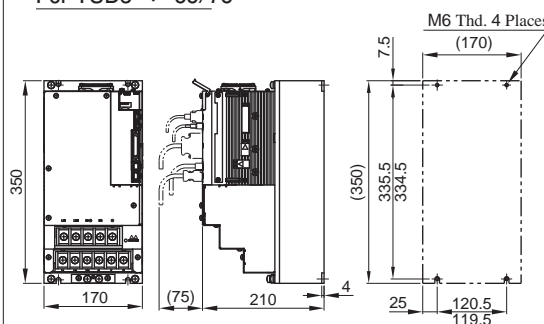
Model Numbers	A	B	C	Mass kg
YSD3-B-55***-***-30	221	209	163	122
YSD3-B-75***-***-30	267	255	209	130

YSD3-F-⁵⁵/₇₅***-***-30 (Flange Mtg. type)



● Servo Pack For YSD3-**-55/75

Dimension of Mtg. Hole Mtg. Standard



Model Numbers	Mass kg
YSD3-F-55***-***-30	116
YSD3-F-75***-***-30	124

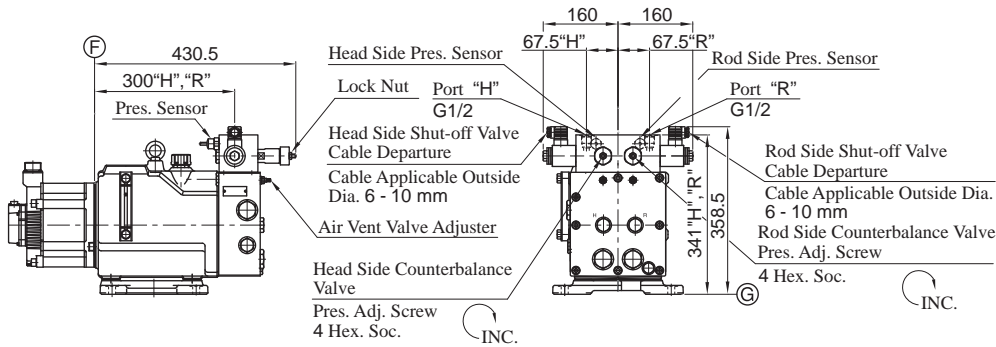
● For other dimensions, refer to the "Bracket Mtg. Type" above.

Mass : 10.2 kg

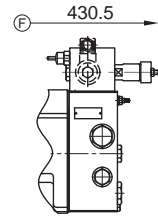
★ If set the servo amplifiers in a row, please contact us separately.

Options

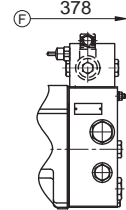
YSD2-*-***-***-BBBB**
(Counterbalance Valves / Shut-off Valves : With Both Sides)



Counterbalance Valves : With Head Side or Rod Side

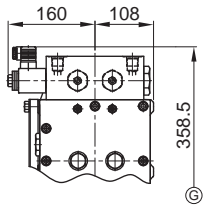


Counterbalance Valves : None

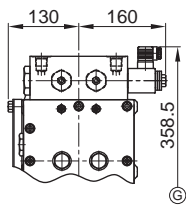


● For other dimensions, refer to "Standard" on the previous page.

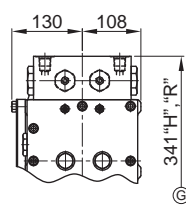
Shut-off Valves : With Head Side



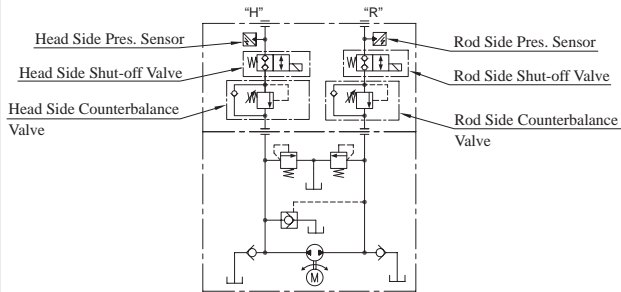
Shut-off Valves : With Rod Side



Shut-off Valves : None



Graphic Symbol



● **Additional Mass with Options**

With options, add the additional mass below on that of "Standard" on the previous page.

Embedded Position of Option Valves		Additional Mass kg
Counterbalance Valves	Shut-off Valves	
Both Sides	Both Sides	10
	Head Side or Rod Side	
Head Side or Rod Side	Both Sides	9
Combination Other Than The Above		

■ **Specifications/Characteristics of Option Valves**
Counterbalance Valves

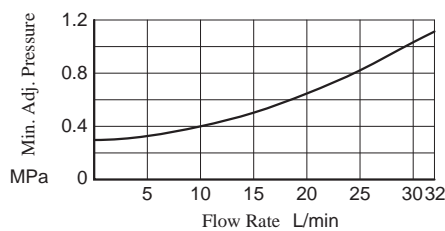
● **Specifications**

Pres. Adj. Range ★ - 7 MPa

★ Please refer to the Min. Adj. Pressure below. If the model embedded with shut-off valves, that minimum adjustment pressure is the below value added pressure drop of shut-off valves.

● **Min. Adj. Pressure**

Viscosity 35 mm²/s Gravity 0.850



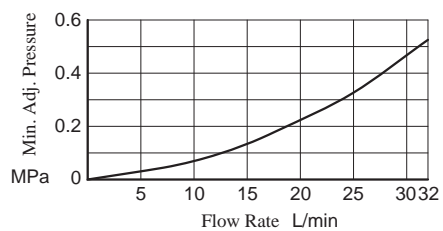
Shut-off Valves

● **Solenoid Ratings**

Power Supply	Voltage (V)		Current/Power at Power Supply Rated	
	Power Supply Rated	Range of Use	Holding Current (A)	Power (W)
DC	24	21.6 - 25.2	1.36	32.7

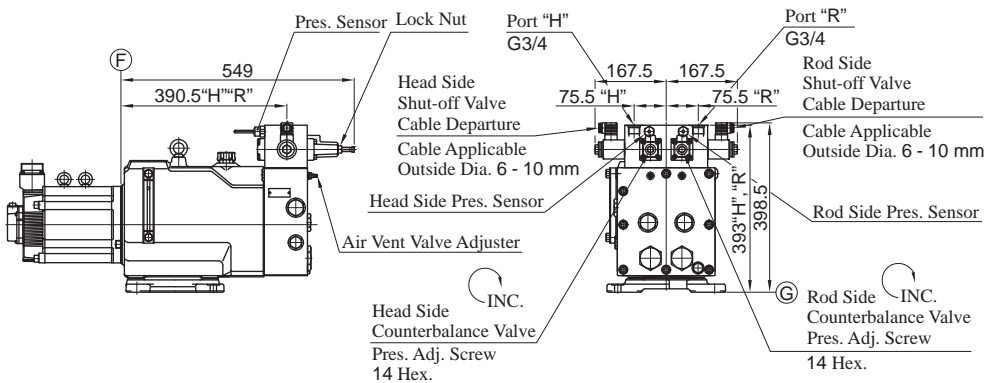
● **Pressure Drop**

Viscosity 35 mm²/s Gravity 0.850



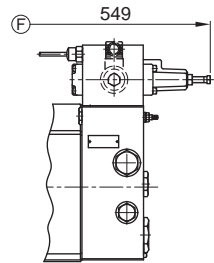
Options

YSD3-*-***-***-***-****-BBBB**
 (Counterbalance Valves / Shut-off Valves : With Both Sides)

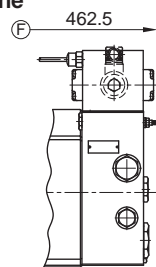


● For other dimensions, refer to "Standard" on page K-65.

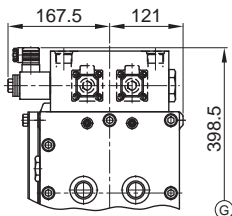
Counterbalance Valves : With Head Side or Rod Side



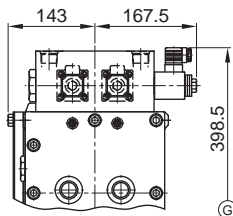
Counterbalance Valves : None



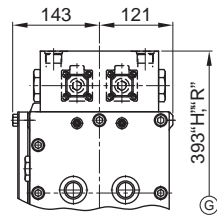
Shut-off Valves : With Head Side



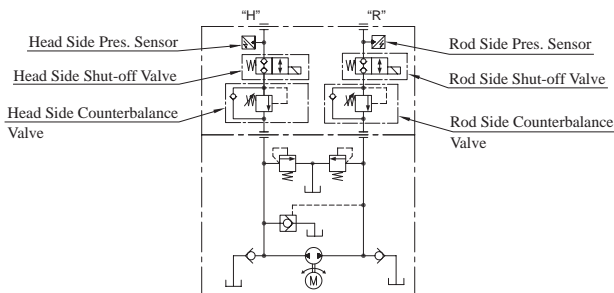
Shut-off Valves : With Rod Side



Shut-off Valves : None



Graphic Symbol



● Additional Mass with Options

With options, add the additional mass below on that of "Standard" on page K-65.

Embedded Position of Option Valves		Additional Mass kg
Counterbalance Valves	Shut-off Valves	
Both Sides	Both Sides	16
	Head Side or Rod Side	
Head Side or Rod Side	Both Sides	15
Combination Other Than The Above		

■ Specifications/Characteristics of Option Valves

Counterbalance Valves

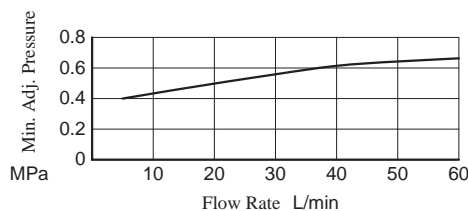
● Specifications

Code of Pres. Adj. Range	Pres. Adj. Range MPa
N	★ - 1.8
A	1.8 - 3.5
B	3.5 - 7

★ Please refer to the Min. Adj. Pressure below. If the model embedded with shut-off valves, that minimum adjustment pressure is the below value added pressure drop of shut-off valves.

● Min. Adj. Pressure

Viscosity 35 mm²/s Gravity 0.850



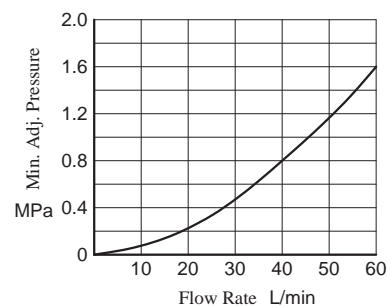
Shut-off Valves

● Solenoid Ratings

Power Supply	Voltage (V)		Current/Power at Power Supply Rated	
	Power Supply Rated	Range of Use	Holding Current (A)	Power (W)
DC	24	21.6 - 25.2	1.36	32.7

● Pressure Drop

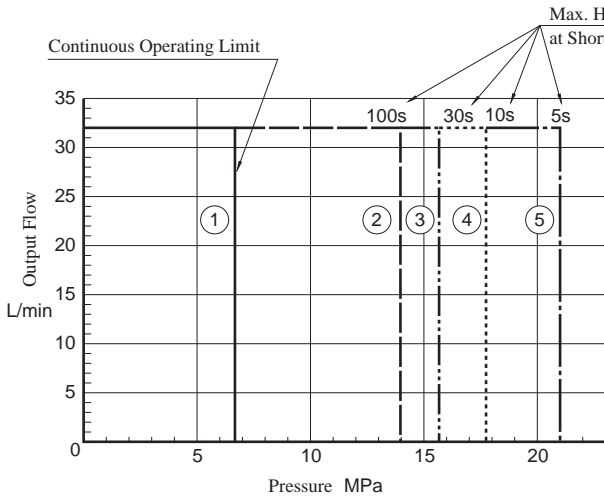
Viscosity 35 mm²/s Gravity 0.850



Pressure vs. Output Flow Characteristics

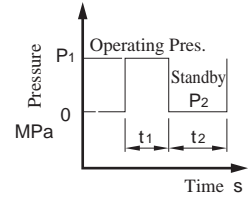
The characteristics charts below show the operating limits of “Pressure” and “Output Flow” calculated with AC servo motor specifications. For the characteristics charts, see the descriptions below.

Description of Characteristics Chart



Standby Time after Short Time Operating

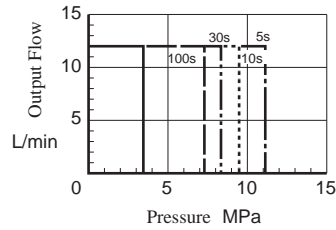
Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s (P ₂ =0 MPa)
21	5	72
18	10	101
16	30	229
14	100	588



- ① ——— Continuous Operating Area: The area can pressurizing continuously.
- ② - ⑤ Short Time Operating Area: The area can use only at the time limited on the characteristics chart. After operating, need a fixed standby time shown on the chart. The standby time on chart is the value at 0 MPa of the standby pressure. If the standby pressure higher than 0 MPa, the standby time is longer. For details, please contact us separately.

YSD1 Type

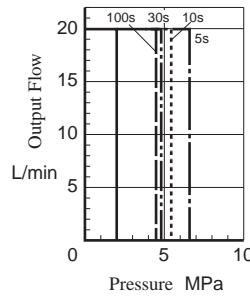
YSD1- * -09*09-6- * *-20



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
11.1	5	86
9	10	105
8	30	238
7	100	607

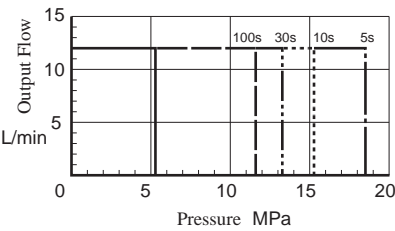
YSD1- * -09*09-10- * *-20



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
6.6	5	86
5.4	10	105
4.9	30	238
4.3	100	607

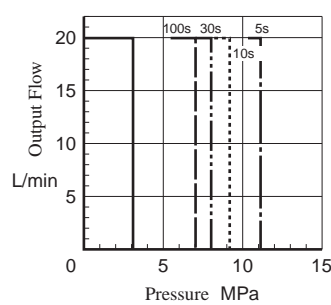
YSD1- * -13*13-6- * *-20



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
18.5	5	120
15	10	123
13	30	275
11.8	100	688

YSD1- * -13*13-10- * *-20

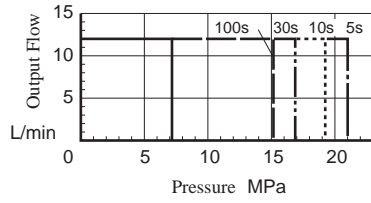


Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
11.1	5	103
9	10	123
8	30	275
7	100	688

YSD2 Type

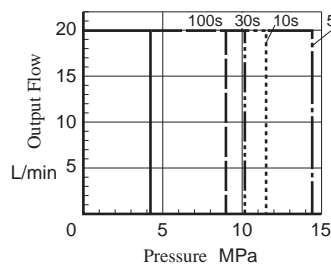
●YSD2- *-24*24-6-**-*-30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	5	61
19	10	100
16.9	30	228
15	100	585

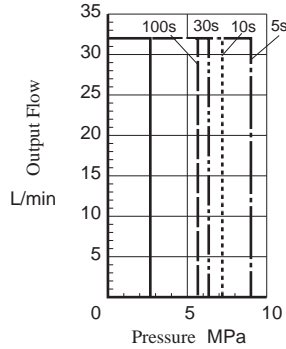
●YSD2- *-24*24-10-**-*-30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
14	5	82
11.5	10	100
10	30	228
9	100	585

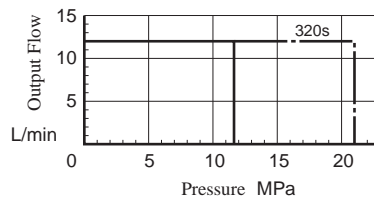
●YSD2- *-24*24-16-**-*-30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
9	5	82
7	10	100
6	30	228
5.7	100	585

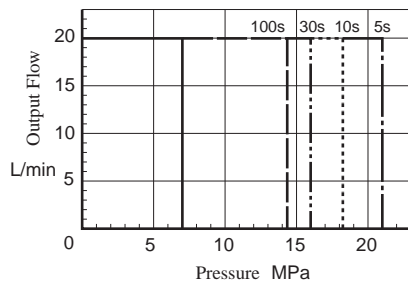
●YSD2- *-29*29-6-**-*-30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	320	1294

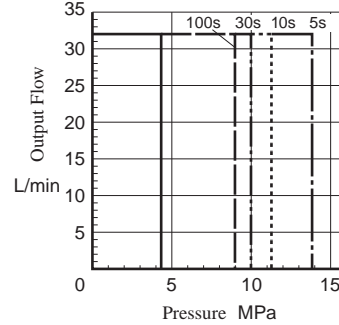
●YSD2- *-29*29-10-**-*-30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	5	65
18	10	95
16	30	218
14	100	562

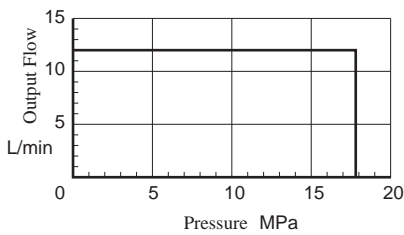
●YSD2- *-29*29-16-**-*-30



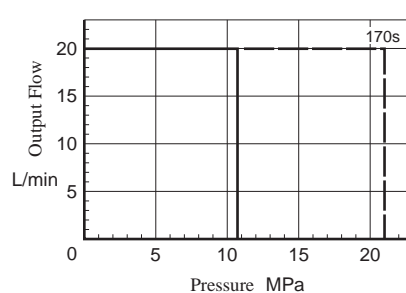
Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
13.9	5	77
11	10	95
10	30	218
9	100	562

●YSD2- *-44*44-6-**-*-30



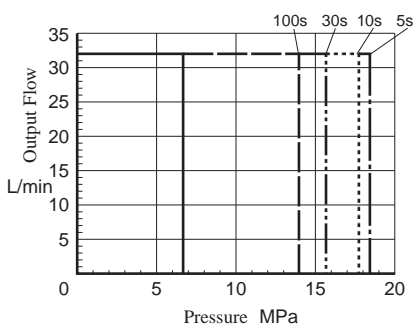
●YSD2- *-44*44-10-**-*-30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	170	852

●YSD2- *-44*44-16-**-*-30



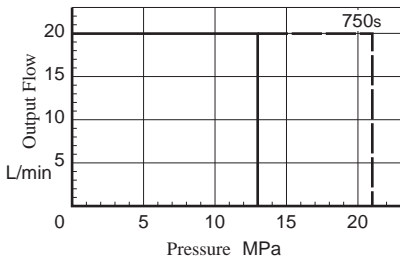
Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
18.3	5	72
17.8	10	101
15.7	30	229
14	100	588

★For the description of characteristics chart, refer to page K-68.

YSD3 Type

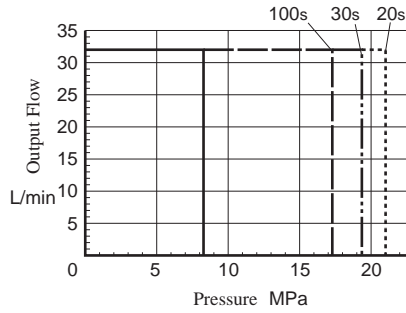
● YSD3- * -55 * 55-10- * * -30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	750	2218

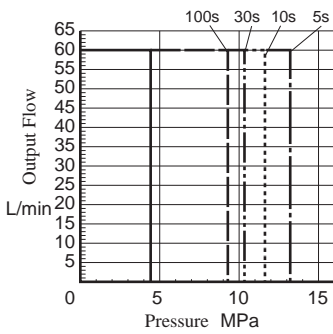
● YSD3- * -55 * 55-16- * * -30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	20	183
19	30	229
17	100	588

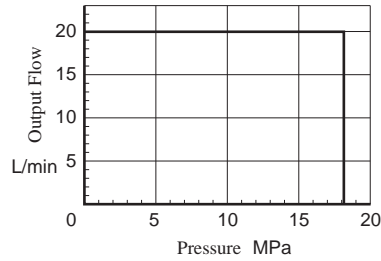
● YSD3- * -55 * 55-30- * * -30



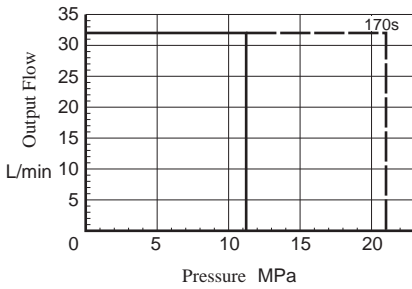
Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
13.2	5	82
11.7	10	101
10	30	229
9	100	588

● YSD3- * -75 * 75-10- * * -30



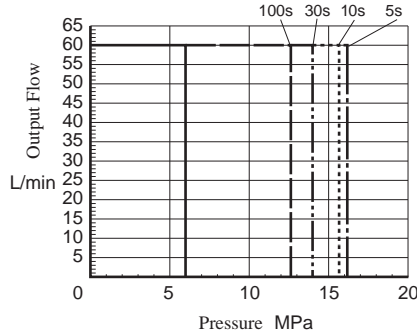
● YSD3- * -75 * 75-16- * * -30



Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
21	170	746

● YSD3- * -75 * 75-30- * * -30

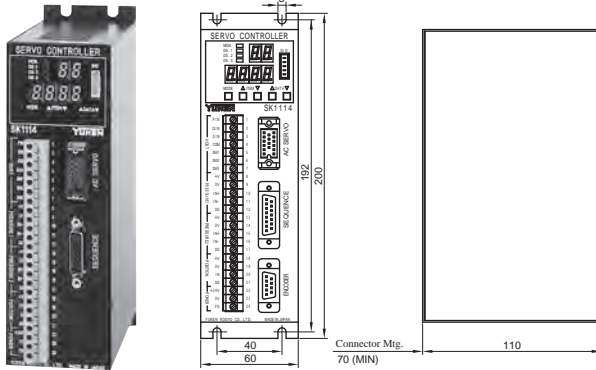


Standby Time after Short Time Operating

Operating Pres. P ₁ MPa	Operating time t ₁ s	Standby Time t ₂ s
16.1	5	80
15.7	10	99
14	30	226
12.7	100	580

★ For the description of characteristics chart, refer to page K-68.

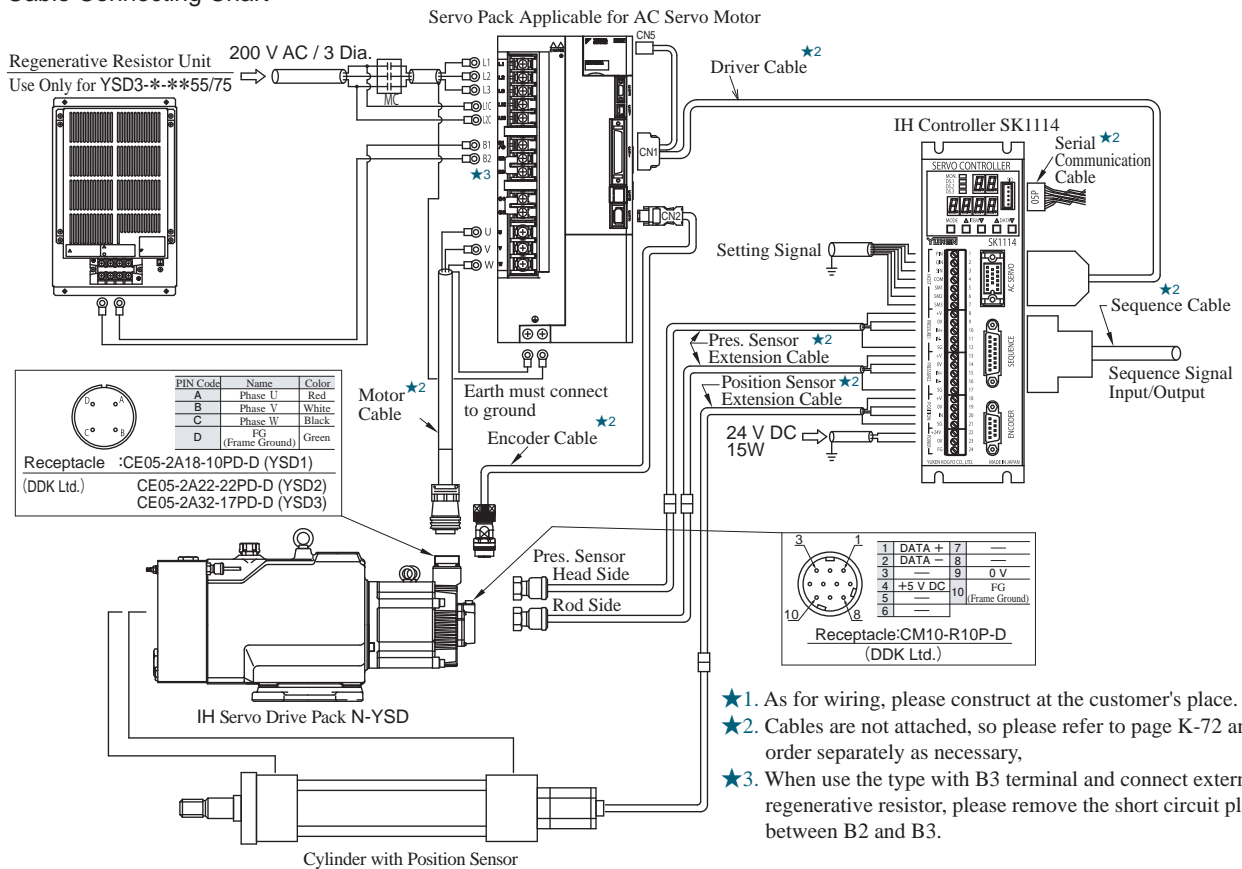
IH Controller : SK1114-11



Specifications

AC Servo Input	±5 V
Input Impedance	10 kΩ (PIN, QIN, SIN)
Power Supply Voltage	24 V DC (21 - 28V Including Ripple)
Max. Power Consumption	10 W
Input Signal	Rated / 5 V (PIN, QIN, SIN)
Signal for Sensor Monitor	±5 V (SM*)
Ambient Temperature	0 - 50 °C
Mass	0.5 kg
ENCODER Input	Option

Cable Connecting Chart



Terminal Details

Terminal Name	No.	Signal	Wire Color
HOST (Setting Signal Input/Output)	1	PIN Pres. Input Signal	
	2	QIN Flow Input Signal	
	3	SIN Position Input Signal	
	4	COM Signal Common	
PRESSURE! (Head Side Pres. Sensor)	5	SM1 General Monitor Output 1	
	6	SM2 General Monitor Output 2	
	7	SM3 General Monitor Output 3	
PRESSURE! (Head Side Pres. Sensor)	8	+V Sensor Power Supply	Red
	9	DV (+4V)	White
	10	IN+ Sensor Input Signal	Green
	11	IN- Sensor Input Signal	Blue
POSITION (Position Sensor)	12	SG Shield Wire	
	13	+V Sensor Power Supply	Red
	14	DV (+4V)	White
	15	IN+ Sensor Input Signal	Green
POWER (Power Supply)	16	IN- Sensor Input Signal	Blue
	17	SG Shield Wire	
	18	+V Sensor Power Supply	Brown
	19	DV (+24V)	Blue/Green
SIO (Serial Communication Cable Connect)	20	IN Sensor Input Signal	Green
	21	SG Shield Wire	
	22	+24V +24[V]	
	23	DV 0[V]	
	24	FG Ground	

Connector Details

AC SERVO (Driver Cable Connect)

No.	Signal	Terminal
1	Speed Command	V-REF
2	Common	SG
3	Torque Monitor	TRQ-M
4	Speed Monitor	VTG-M
5	Common	SG
6	Input	ALO1
7	Alarm Code	ALO2
8	Input	ALO3
9	Common	SG
10	Servo ON	SV-ON
11	Alarm OFF	ALM-RST
12	+24V [V]	+24V
13	Servo Standby	S-RDY+
14	Input	S-RDY-
15	Alarm	ALM+
16	Input	ALM-

SIO (Serial Communication Cable Connect)

No.	Signal	Terminal
1	TxD Send Data	Output
2	RxD Receive Data	Input
3	RTS Send Require	Output
4	CTS Send Ready	Input
5	GND Common	

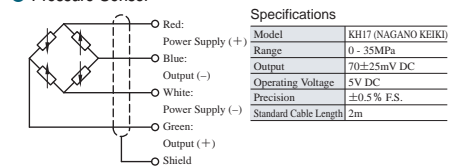
SEQUENCE (Sequence Cable Connect)

No.	Signal	Terminal
1	COM Input Common	
2	IN1 Code Input (BIN)	
3	IN2 x0 - x7	
4	IN3	
5	IN4 Select Control Mode	
6	IN5 Select Control Direction	
7	IN6 Standby	
8	IN7 Alarm Reset	
9	IN8 Servo ON	
10	OUT1 Code Change Recognition	
11	OUT2 Standby	
12	OUT3 Coincidence	
13	OUT4 Alarm	
14	COM Output Common	
15	Unused	

Cable Connector and Wire

	Sequence Cable	Driver Cable	Serial Communication Cable
Housing	DA-15P (JAE)	MR-16M (HONDA)	XHP-5 (JST)
Terminal	DA-C4-J10 (JAE)	MR-16L (HONDA)	SXH-00IT-P0.6 (JST)
Case	DA-C4-J10 (JAE)	MR-16L (HONDA)	
Core Wire Size	AWG #20	AWG #24 - 28	AWG #22 - 28
Coated Outside Dia.	2.9 Dia.	1.2 - 1.5 Dia.	0.9 - 1.9 Dia.
Strip Length	2.0 - 2.5mm	2.0 - 2.5mm	1.2 - 2.6mm

Pressure Sensor



Position Sensor

Model	BTLS-A11-*(BALLUFF)
Standard Cable Length	5m

Cables

Cables are not attached for IH servo drive pack, so please refer to the table below and order separately as necessary.
The cables except for motor cable are common to each model.

Motor Cable

IH Servo Drive Pack Model Numbers	Cable Model Numbers	Notes
YSD1- *-09 *-	YSDC-M1-09-☆-★-10	☆ : Plug Type S : Straight Type L : L Type ★ : Cable Length 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m N : Plug and Cable Clamp Only
YSD1- *-13 *-	YSDC-M1-13-☆-★-10	
YSD2- *-24 *-	YSDC-M1-29-☆-★-10	
YSD2- *-29 *-	YSDC-M1-29-☆-★-10	
YSD2- *-44 *-	YSDC-M1-44-☆-★-10	
YSD3- *-55 *-	YSDC-M1-55-☆-★-10	
YSD3- *-75 *-	YSDC-M1-75-☆-★-10	

Sequence Cable / Driver Cable

Cable Type	Cable Model Numbers	Notes
Sequence Cable	YSDC-S1-00-★-10	★ : Cable Length 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m
Driver Cable	YSDC-D1-★-10	★ : Cable Length 01 : 1m 02 : 2m 03 : 3m

Encoder Cable / Pres. Sensor Extension Cable / Position Sensor Extension Cable

Cable Type	Cable Model Numbers	Notes
Encoder Cable	YSDC-E8-☆-★-10	☆ : Plug Type S : Straight Type L : L Type ★ : Cable Length R03 : 0.3m 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m
Pres. Sensor Extension Cable	YSDC-P1-01-★-10	★ : Cable Length 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m 50 : 50m
Position Sensor Extension Cable	YSDC-L1-01-★-10	★ : Cable Length 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m

Serial Communication Cable

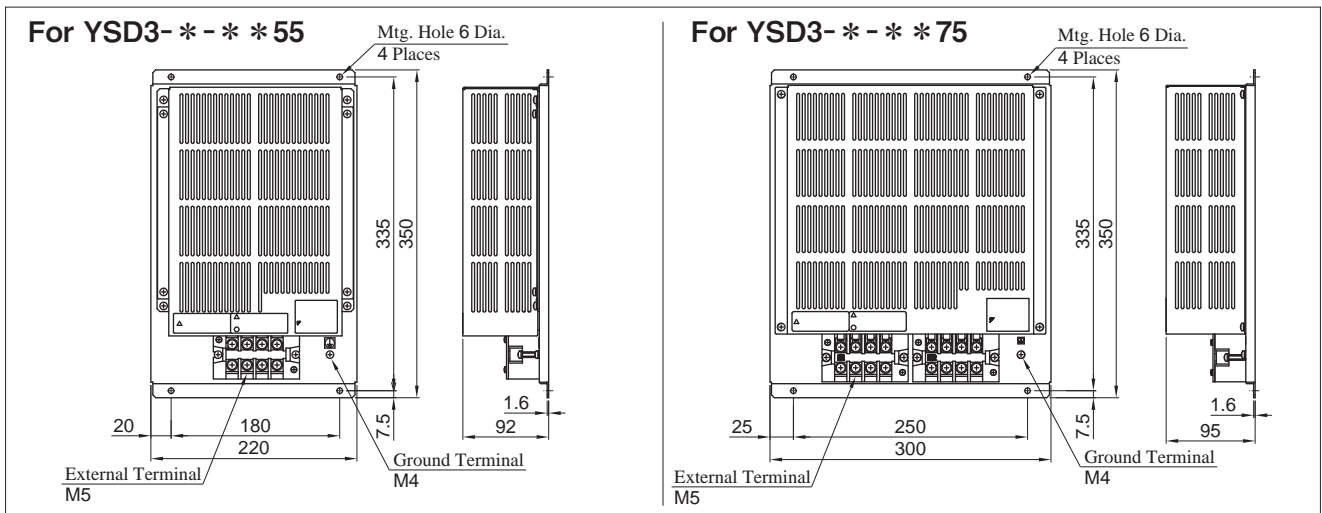
Cable Type	Cable Model Numbers	Notes
Serial Communication Cable	YSDC-T2-☆-★-10	☆ : Cable End Type 02 : Dsub-9pin ★ : Cable Length 03 : 3m 05 : 5m 10 : 10m

Regenerative Resistor Unit

Specifications

IH Servo Drive Pack Model Numbers	YASKAWA ELECTRIC Model	Resistance Value	Power	Approx. Mass kg
YSD3- *- * * 55-	JUSP-RA04-E	6.25Ω (25Ω×4Parallel Connected)	880W (220W×4)	4.2
YSD3- *- * * 75-	JUSP-RA05-E	3.13Ω (25Ω×8Parallel Connected)	1760W (220W×8)	6.6

★Regenerative resistor may reach to high temperature. Please use heat-resistant fireproof wires and avoid to contact the regenerative resistor on wiring.



Interchangeability between Current and New Models

Because the motor manufacturer stopped production of the built-in servo motor, so IH servo drive pack has changed models as below.

Major Changes

- ① Totally Change of Servo Motor and Servo Pack.
- ② 1.8 kW embedded model changes to 2.4 kW embedded model same as above.
- ③ Change The Connector Type of Encoder Cable.

Design Number

Series	Change of Design Number
YSD1	10→20 Design
YSD2/YSD3	20→30 Design

Interchangeability in Installation

There is interchangeability between current and new pumps with no changes.

As for servo motor, servo pack and encoder cable, there is no interchangeability between current and new models, so these parts of current design have to exchange as a set.

Interchangeability	Name	No Interchangeability / Differences	No Interchangeability / Details
Yes	Pump	_____	_____
No	Servo Motor	Distance from Pump Mtg. Surface to Cable Connecting Position	Page K-74
No	Servo Pack	Mtg. Hole Dimensions	Page K-75
		Connector Insert Direction for YSD3	
Yes	Motor Cable Sequence Cable Driver Cable Pres. Sensor Extension Cable Position Sensor Extension Cable	_____	_____
No	Serial Communication Cable	Cable End Type : Delete Some Parts	Page K-76
No	Encoder Cable	Cable Length, Connector type	Pages K-73, K-75
Yes★	Regenerative Resistor Unit	_____	_____

★The model numbers are changed (see the table below).

Model Numbers

① IH Servo Drive Pack

Current Model Numbers	New Model Numbers
YSD2-* -18A18-* - * - * - * - * - * -20	YSD2-* -24A24-* - * - * - * - * - * -30

② Encoder Cable / Regenerative Resistor Unit

Current Model Numbers		New Model Numbers	
Encoder Cable	Regenerative Resistor Unit	Encoder Cable	Regenerative Resistor Unit
YSDC-E1-☆-★-10 ★ : Cable Length 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m 50 : 50m	JUSP-RA04	YSDC-E8-☆-★-10 ★ : Cable Length R3 : 0.3m 03 : 3m 05 : 5m 10 : 10m 15 : 15m 20 : 20m	JUSP-RA04-E
	JUSP-RA05		JUSP-RA05-E

Specifications

Current and new models are same except below.

1. Servo Motor Output / Servo Pack type

Current			New		
Model Numbers	Servo Motor Output	Servo Pack type	Model Numbers	Servo Motor Output	Servo Pack type
YSD2-* -18A18	1.8 kW	For 1.8 kW Motor	YSD2-* -24A24	2.4 kW	For 2.4 kW Motor

2. Mass

① Pump / Motor

Current			New		
Model Numbers	Mass Flange Mtg. Type	Mass Foot Mtg. Type	Model Numbers	Mass Flange Mtg. Type	Mass Foot Mtg. Type
YSD1-* -09A09-* - * -10	50 kg	53 kg	YSD1-* -09A09-* - * -20	48 kg	51 kg
YSD1-* -13A13-* - * -10	52 kg	55 kg	YSD1-* -13A13-* - * -20	49 kg	52 kg
YSD2-* -29A29-* - * -20	82 kg	88 kg	YSD2-* -29A29-* - * -30	78 kg	84 kg
YSD2-* -44A44-* - * -20	87 kg	93 kg	YSD2-* -44A44-* - * -30	82 kg	88 kg
YSD3-* -55A55-* - * -20	124 kg	130 kg	YSD3-* -55A55-* - * -30	116 kg	122 kg
YSD3-* -75A75-* - * -20	134 kg	140 kg	YSD3-* -75A75-* - * -30	124 kg	130 kg

② Servo Pack

Current		New	
Type	Mass	Type	Mass
For YSD1-* -09	1.7 kg	For YSD1-* -09	1.5 kg
For YSD1-* -13	2.8 kg	For YSD1-* -13	2.4 kg
For YSD2-* -18/29	3.8 kg	For YSD2-* -24	2.8 kg
For YSD2-* -44	5.5 kg	For YSD2-* -29/44	4.6 kg
For YSD3-* -55/75	14.6 kg	For YSD3-* -55/75	10.2 kg

Characteristics

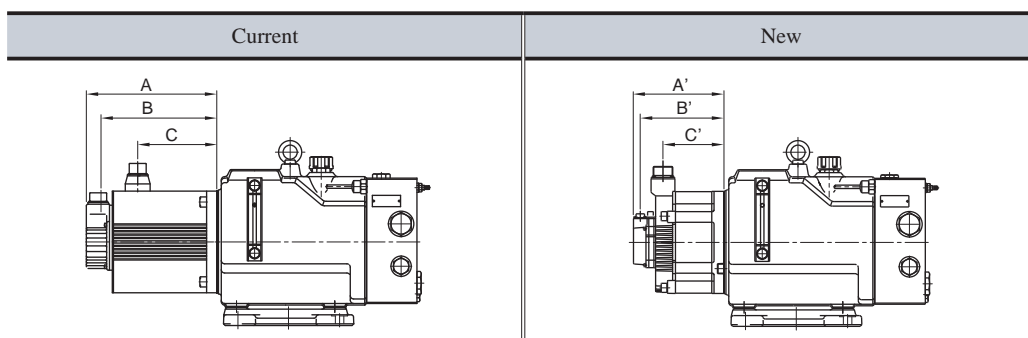
Pressure vs. Output Flow Characteristics are changed as below.

- ① Operating pressure at short time operating is changed a part.
- ② Delete the forced air cooling area at continuous and short time operating.

Dimensions

① Pump / Motor

Current				New			
Model Numbers	A	B	C	Model Numbers	A'	B'	C'
YSD1-* -09A09-* - * -10	161	140	88	YSD1-* -09A09-* - * -20	137	125	83
YSD1-* -13A13-* - * -10	185	164	112	YSD1-* -13A13-* - * -20	153	141	99
YSD2-* -18A18-* - * -20	166	144	89	YSD2-* -24A24-* - * -30	160	148	108
YSD2-* -29A29-* - * -20	192	170	115	YSD2-* -29A29-* - * -30	160	148	108
YSD2-* -44A44-* - * -20	226	204	149	YSD2-* -44A44-* - * -30	184	172	132
YSD3-* -55A55-* - * -20	260	238	174	YSD3-* -55A55-* - * -30	221	209	163
YSD3-* -75A75-* - * -20	334	312	248	YSD3-* -75A75-* - * -30	267	255	209



④ Serial Communication Cable

Descriptions	Current	New
Cable Model Numbers	YSDC-T1-☆-★-10	YSDC-T2-☆-★-10
Cable End Type	01 : Dsub-25pin 02 : Dsub-9pin	02 : Dsub-9pin

■ Solenoid Ratings

Type	Power Supply	Coil Type★3	Frequency (Hz)	Voltage (V)		Current/Power at Rated Power Supply Voltage			
				Power Supply Rated	Range of Use	Inrush Current★2 (A)	Holding Current (A)	Power (W)	
Standard Type	AC ★1	A 100	50	100	80 - 110	2.42	0.51	—	
			60	100	90 - 120	2.14	0.37		
				110		2.35	0.44		
		A 120	50	120	96 - 132	2.02	0.42		
			60		108 - 144	1.78	0.31		
			A 200	50	200	160 - 220	1.21		0.25
60	200	180 - 240		1.07	0.19				
	220		1.18	0.22					
Shockless Type	DC (K Series)	D 12	—	12	10.8 - 13.2	—	2.45	29	
				24	21.6 - 26.4		1.23		
				48	43.2 - 52.8		0.61		
		R (AC→DC)	50/60	R 100	100	90 - 110	—	0.33	29
				R 200	200	180 - 220		0.16	
					240	192 - 264		0.89	

★1. AC Solenoid

AC Solenoid (A*) is not available for the shockless type. If need shockless type of power supply, please order R type solenoid (R*).

★2. Inrush Current

The inrush current value indicates the rms value at max. stroke.

★3. The coil types other than the above are also available. For details, please contact us separately.

The coil types highlighted with shade represent the optional extras. If use, please confirm the time of delivery with us before ordering.

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
 Ангартск (3955)60-70-56
 Архангельск (8182)63-90-72
 Астрахань (8512)99-46-04
 Барнаул (3852)73-04-60
 Белгород (4722)40-23-64
 Благовещенск (4162)22-76-07
 Брянск (4832)59-03-52
 Владивосток (423)249-28-31
 Владикавказ (8672)28-90-48
 Владимир (4922)49-43-18
 Волгоград (844)278-03-48
 Вологда (8172)26-41-59
 Воронеж (473)204-51-73
 Екатеринбург (343)384-55-89
 Иваново (4932)77-34-06
 Ижевск (3412)26-03-58
 Иркутск (395)279-98-46
 Казань (843)206-01-48

Калининград (4012)72-03-81
 Калуга (4842)92-23-67
 Кемерово (3842)65-04-62
 Киров (8332)68-02-04
 Коломна (4966)23-41-49
 Кострома (4942)77-07-48
 Краснодар (861)203-40-90
 Красноярск (391)204-63-61
 Курган (3522)50-90-47
 Курск (4712)77-13-04
 Липецк (4742)52-20-81
 Магнитогорск (3519)55-03-13
 Москва (495)268-04-70
 Мурманск (8152)59-64-93
 Набережные Челны (8552)20-53-41
 Нижний Новгород (831)429-08-12
 Новокузнецк (3843)20-46-81
 Новосибирск (383)227-86-73
 Ноябрьск (3496)41-32-12

Омск (3812)21-46-40
 Орел (4862)44-53-42
 Оренбург (3532)37-68-04
 Пенза (8412)22-31-16
 Пермь (342)205-81-47
 Петрозаводск (8142)55-98-37
 Псков (8112)59-10-37
 Ростов-на-Дону (863)308-18-15
 Рязань (4912)46-61-64
 Самара (846)206-03-16
 Санкт-Петербург (812)309-46-40
 Саранск (8342)22-96-24
 Саратов (845)249-38-78
 Севастополь (8692)22-31-93
 Симферополь (3652)67-13-56
 Смоленск (4812)29-41-54
 Сочи (862)225-72-31
 Ставрополь (8652)20-65-13
 Сургут (3462)77-98-35

Сыктывкар (8212)25-95-17
 Тамбов (4752)50-40-97
 Тверь (4822)63-31-35
 Тольятти (8482)63-91-07
 Томск (3822)98-41-53
 Тула (4872)33-79-87
 Тюмень (3452)66-21-18
 Улан-Удэ (3012)59-97-51
 Ульяновск (8422)24-23-59
 Уфа (347)229-48-12
 Хабаровск (4212)92-98-04
 Чебоксары (8352)28-53-07
 Челябинск (351)202-03-61
 Череповец (8202)49-02-64
 Чита (3022)38-34-83
 Якутск (4112)23-90-97
 Ярославль (4852)69-52-93