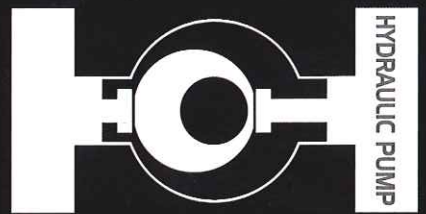


ROYAL HYDRAULIC PUMP PUNCHER



ROYAL MASTER

SANKYO CO.LTD.

Royal Master Hydraulic Pump Units



■ These High-pressure hydraulic Pump units, which feature superior durability despite their small size and light weight, have an excellent track record of about 40 years serving in demanding applications as hydraulic punchers, and working under harsh conditions including civil engineering projects and foundries.

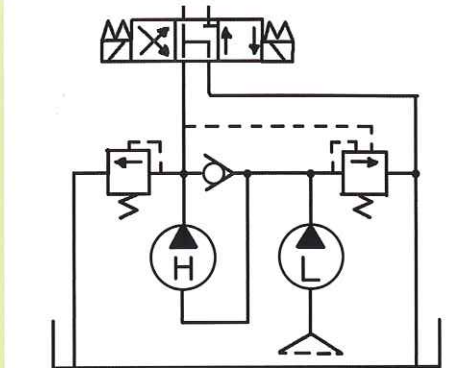
■ The single-piece rotor shaft shows its strength in repeated starting and stopping.*

■ Our wet-type solenoid valve(S-D4-SGS-AHB), which has extremely small leakage, suppresses heat generation and helps our high-efficiency pumps do their jobs.*

■ To ensure safety, pumps with three-position, four-way solenoid valves have 24 VAC local control circuits.

■ We will attach manual changeover valves, pressure gauges, pressure switches, and other components, and change pumps to your desired circuits.

* The 1SW-40 has a split shaft and is equipped with a dry-type solenoid valve.



THREE-POSITION, FOUR-WAY SOLENOID VALVES

TECHNICAL NOTE

Hydraulic pumps develop the same pressure despite their different sizes. The only difference is the discharge rate; a larger rate means you can work faster.



D-3SW



D-2SW-4



D-1SW-4



1SW-40

Specifications/model		D-3SW	D-2SW-4	D-1SW-4	1SW-40
Motor		2.2kw	1.5kw	0.75kw	0.4kw
		AC380V or AC415V 50Hz 3Phase	AC380V or AC415V 50Hz 3Phase	AC380V or AC415V 50Hz 3Phase	AC220V 50Hz S.Phase
Pressure	High-Pressure	72MPa (720bar)			
	Low-Pressure	7MPa (70bar)			3MPa
Discharge rate ※	High-Pressure	2.3L/min	1.5L/min	0.75L/min	0.3L/min
	Low-Pressure	5.8L/min	3.75L/min	3.75L/min	1.9L/min
Reservoir		12L	10L	7.5L	5L
Weight		65kg	55kg	38kg	28kg
Solenoid-Valve		Three-position, four-way			Two-position, four-way

※ Discharge rate for 50 Hz.

Royal Master Hydraulic Punchers



Elongated holes available

Square holes available

- All units, from the small, light models to powerful types, are chosen by our customers because of their excellent ease of operation.
- Standard models are used to punch elongated holes. Punches with elongated holes are also available, and we have a large inventory.*
- In combination with the powerful Royal double-acting hydraulic pump, these punchers will punch holes quickly, accurately, safely, and quietly.**
- The new 506NSW, a puncher for small shape steel, has a 5° taper die for channel steel that is a standard item in stock.

* Elongated holes are an option for the 1150SW only.
 ** Noise is generated when steel material is very hard.

TECHNICAL NOTE
 In making holes with these punchers, hole diameter must be larger than material thickness (SS400).



Model Specification	506NSW	606NSW	706NSW	711NSW	911NSW	1101SW	1150SW
Maximum capacity	270kN (27Ton)	350kN (35Ton)	450kN (45Ton)	500kN (50Ton)	600kN (60Ton)	650kN (65Ton)	1000kN (100Ton)
Maximum ability (ss400)	φ 18 × 12 φ 24 × 9	φ 22 × 13 φ 24 × 12	φ 24 × 16 φ 25 × 15	φ 24 × 16 φ 28 × 14	φ 24 × 20 φ 28 × 17	φ 25 × 21 φ 30 × 17	φ 30 × 25 φ 32 × 23
Reach	55mm	60mm	60mm	110mm	102mm	102mm	150mm
Weight ※	14kg	18kg	22.5kg	33.8kg	35.5kg	42.5kg	120kg
Applicable hyd. pump	72MPa (720bar), Double-acting type						
Accessories	φ 11, 14 18, 22	φ 11, 14 18, 22	φ 14, 18 22, 24	φ 17.5, 22 20.5, 24	φ 17.5, 22 20.5, 24	φ 17.5, 22 20.5, 24	φ 22, 24 28, 30

When purchased as a set with a hydraulic pump, two 5-m hoses are included. Customers can change the accessories to desired sizes.

※ Notation weight does not include hoses and an intermediate code.

Maximum punching speed

Dimensions of Royal Master Hydraulic Punchers

Dimensions of Royal Master Hydraulic Pumps

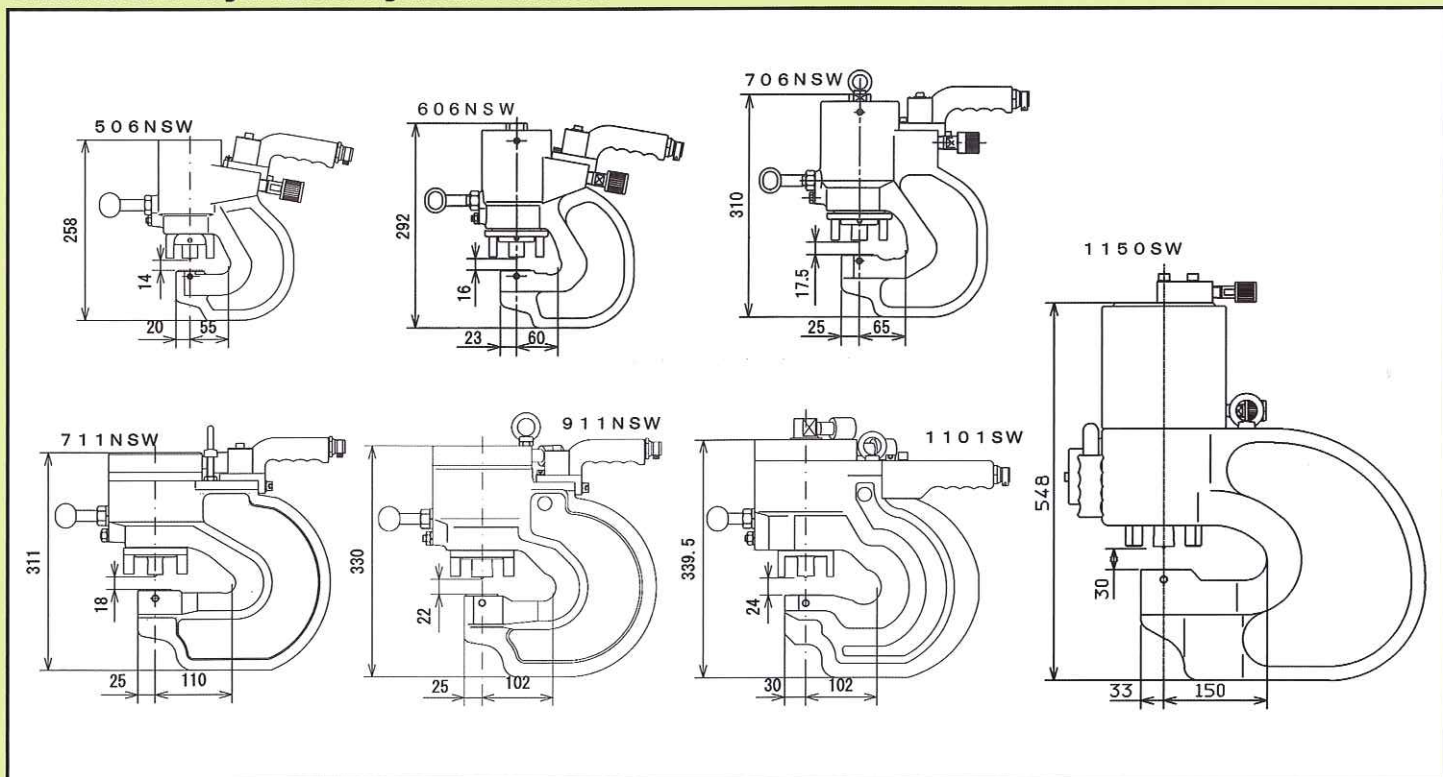


Maximum punching speed (keep in mind when selecting a hydraulic pump)

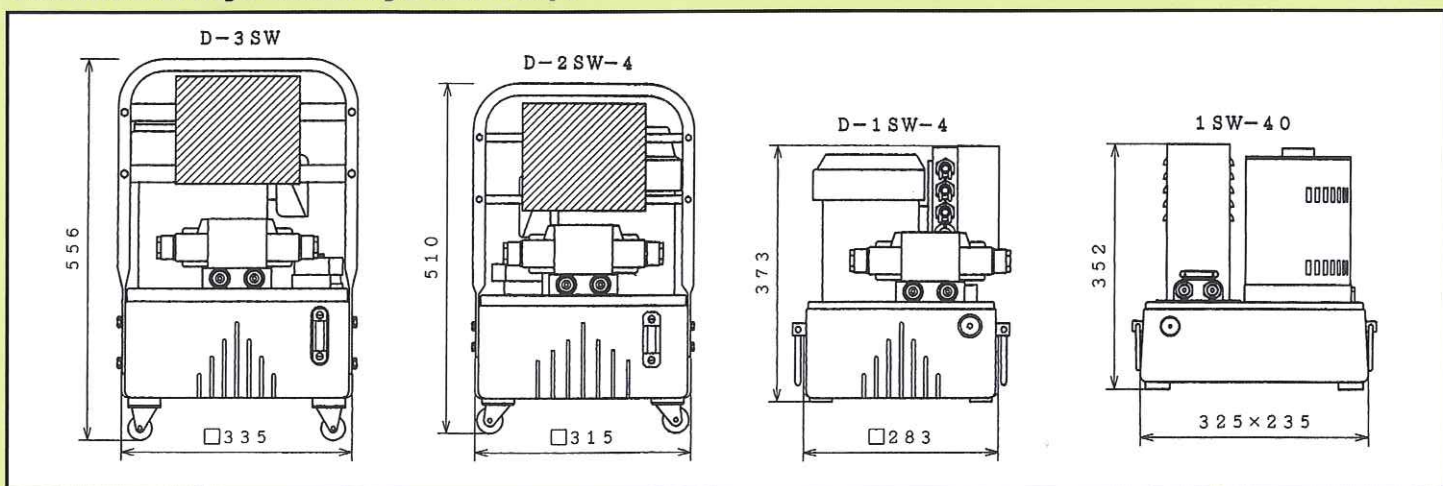
※ The time for one cycle is that needed for the bit to punch a hole and return (based on 50 Hz). There will be some variation depending on working conditions.

Puncher		506NSW		606NSW		706NSW		711NSW		911NSW		1101SW		1150SW	
Time (s)		Punch	Return	Punch	Return	Punch	Return	Punch	Return	Punch	Return	Punch	Return	Punch	Return
Hyd. pump	D-3SW	1.2	0.6	1.6	0.7	1.9	1.1	2.8	1.4	4.8	1.7	5.2	2.2	7.8	4.6
	D-2SW	1.9	0.7	2.4	1	3	1.6	4.2	2	7.2	2.6	7.8	3.4	12	7.2
	D-1SW	3.2	0.7	3.8	1	4.8	1.6	7.2	2	13.2	2.6	14.2	3.4	16.2	7.2
	1SW-40	8.2	1.6	9.6	3.6	12.1	6	15.6	8.4						

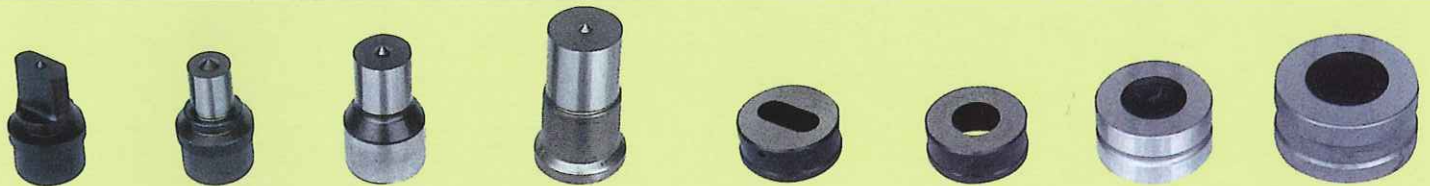
Dimensions of Royal Master Hydraulic Punchers



Dimensions of Royal Master Hydraulic Pumps



Dimensions of Royal Punches and Dies Standard off The Shelf Sizes



	For 606N, 706N	For 711N, 911N	For 1101	For 1150	For 506N
Punch					
Die					
Cap of punch					
Maximum size					

Standard Size's Available (Special Upon Request)

Round hole for 606N,706N	40 sizes from min ϕ 6mm to max ϕ 25.5mm (every 0.5mm)																
Elongated hole for 606N,706N	8 × 20		9 × 20		10 × 18		10 × 20		10 × 22		11 × 20		11 × 24				
	11 × 25		12 × 20		12 × 24		12 × 25		13 × 25		14 × 20		14 × 24				
	14 × 25		15 × 20		15 × 24		15 × 25		16 × 24		16 × 25		18 × 24				
	18 × 25		19 × 25		20 × 25		22 × 25		(mm)								
Round hole for 711N,911N,1101	6	6.5	7	8	9	10	11	12	13	14	14.5	15	16	17			
	17.5	18	18.5	19	20	20.5	21	22	22.5	23	23.5	24	24.5	25			
	25.5	26	26.5	27	27.5	28	(mm)		For 1101 Only		29		30				
Elongated hole for 711N,911N,1101	12 × 25		12 × 28		13 × 28		14 × 18		14 × 24		14 × 28		15 × 25		15 × 28		
	16 × 25		16 × 28		18 × 25		18 × 28		19 × 25		19 × 28		20 × 25		20 × 28		
	22 × 25		22 × 28		(mm)		For 1101 Only		15 × 30		18 × 30		20 × 30		22 × 30		25 × 30
Round hole for 1150	8	9	10	11	12	13	14	15	16	17	18	19	20	20.5			
	21	22	22.5	23	24	24.5	25	25.5	26	26.5	27	27.5	28	29			
	29.5	30	30.5	31	32	(mm)											
Round hole for 506N	6	7	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5			
	14	14.5	15	15.5	16	16.5	17	17.5	18	18.5	19	19.5	20	20.5			
	21	21.5	22	23	24	(mm)											
Elongated hole for 506N	8 × 20		9 × 20		10 × 20		11 × 20		12 × 24		14 × 24		15 × 24				
	18 × 24		(mm)														
Round hole 5° taper die for 506N			11	12	14	15	18	19	20	22	(mm)						

Sizes other than the above can be made to order (but no larger than the maximum size).

Punching possibility range

1. Relation of the material thickness and minimum holes diameter

- SS400 Mild steel Hole diameter $\geq 1.1 \times$ Thickness
- SUS304 316 Stainless steel Hole diameter $\geq 1.5 \times$ Thickness

2. The output calculation for punching holes

- SS400 Mild steel $P(\text{Ton}) \approx L \times T \times 0.04$
- SUS304 316 Stainless steel $P(\text{Ton}) \approx L \times T \times 0.06$

(Round hole : $L = 3.14 \times D$)

$L =$ Lap length of a hole(mm) $D =$ Diameter(mm) $T =$ Thickness(mm)

SS400 Mild steel

(Ton)

Thickness Hole dia	3mm	4.5mm	6mm	9mm	11mm	12mm	13mm	16mm	19mm	20mm	22mm	25mm
φ 6	2.3	3.4										
φ 8	3	4.5	6						When you used it in a range except tonnage indication, the punch is broken immediately			
φ 10	3.8	5.7	7.5	11.3								
φ 12	4.5	6.8	9	13.6	16.6							
φ 14	5.3	7.9	10.6	15.8	19.4	21.1						
φ 16	6	9	12.1	18.1	22.1	24.1	26.1					
φ 18	6.8	10.2	13.6	20.6	24.9	27.1	29.4	36.2				
φ 20	7.5	11.3	15.1	22.6	27.6	30.2	32.7	40.2				
φ 22	8.3	12.4	16.6	24.9	30.4	33.2	35.9	44.2	52.5	55.3		
φ 24	9	13.6	18.1	27.1	33.2	36.2	39.2	48.3	57.3	60.3	66.4	
φ 25	9.4	14.1	18.8	28.3	34.6	37.7	40.8	50.3	59.7	62.8	69.1	
φ 28	10.6	15.8	21.1	31.7	38.7	42.2	45.7	56.3	66.9	70.4	77.4	88
φ 30	11.3	17	22.6	33.9	41.5	45.2	49	60.3	71.6	75.4	82.9	94.2

SUS304 316 Stainless steel

(Ton)

Thickness Hole dia	3mm	4.5mm	6mm	8mm	9mm	10mm	11mm	12mm	13mm	14mm	15mm	16mm
φ 8	4.5	6.8							When you used it in a range except tonnage indication, the punch is broken immediately			
φ 10	5.7	8.5	11.3									
φ 12	6.8	10.2	13.6	18.1								
φ 14	7.9	11.9	15.8	21.1	23.8							
φ 16	9	13.6	18.1	24.1	27.1	30.2						
φ 18	10.2	15.3	20.4	27.1	30.5	33.9	37.3	40.7				
φ 20	11.3	17	22.6	30.2	33.9	37.7	41.5	45.2	49			
φ 22	12.4	18.7	24.9	33.2	37.3	41.5	45.6	49.7	53.9	58.1		
φ 24	13.6	20.4	27.1	36.2	40.7	45.2	49.8	54.3	58.8	63.3	67.9	72.4
φ 25	14.1	21.2	28.3	37.7	42.4	47.1	51.8	56.5	61.3	66	70.7	75.4
φ 28	15.8	23.8	31.7	42.2	47.5	52.8	58.1	63.3	68.6	73.9	79.2	84.4
φ 30	17	25.4	33.9	45.2	50.9	56.5	62.2	67.7	73.5	79.2	84.8	90.5

Use range according to a model

506NSW	←506NSW use range
606NSW	←606NSW use range
706NSW	←706NSW use range
711NSW	←711NSW use range
911NSW	←911NSW use range
1101SW	←1101SW use range
1150SW	←1150SW use range



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