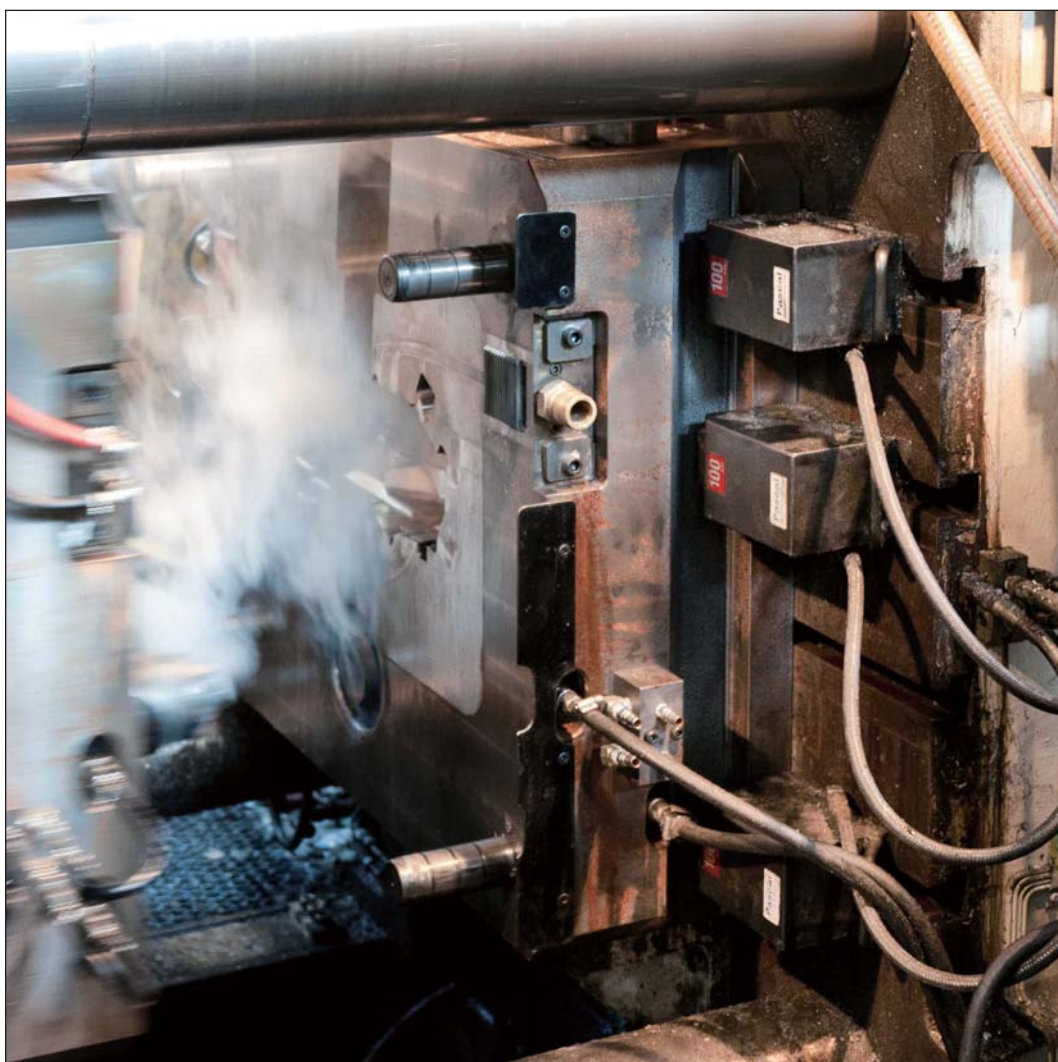


# Pascal die-clamping system

FOR DIE-CASTING MACHINE

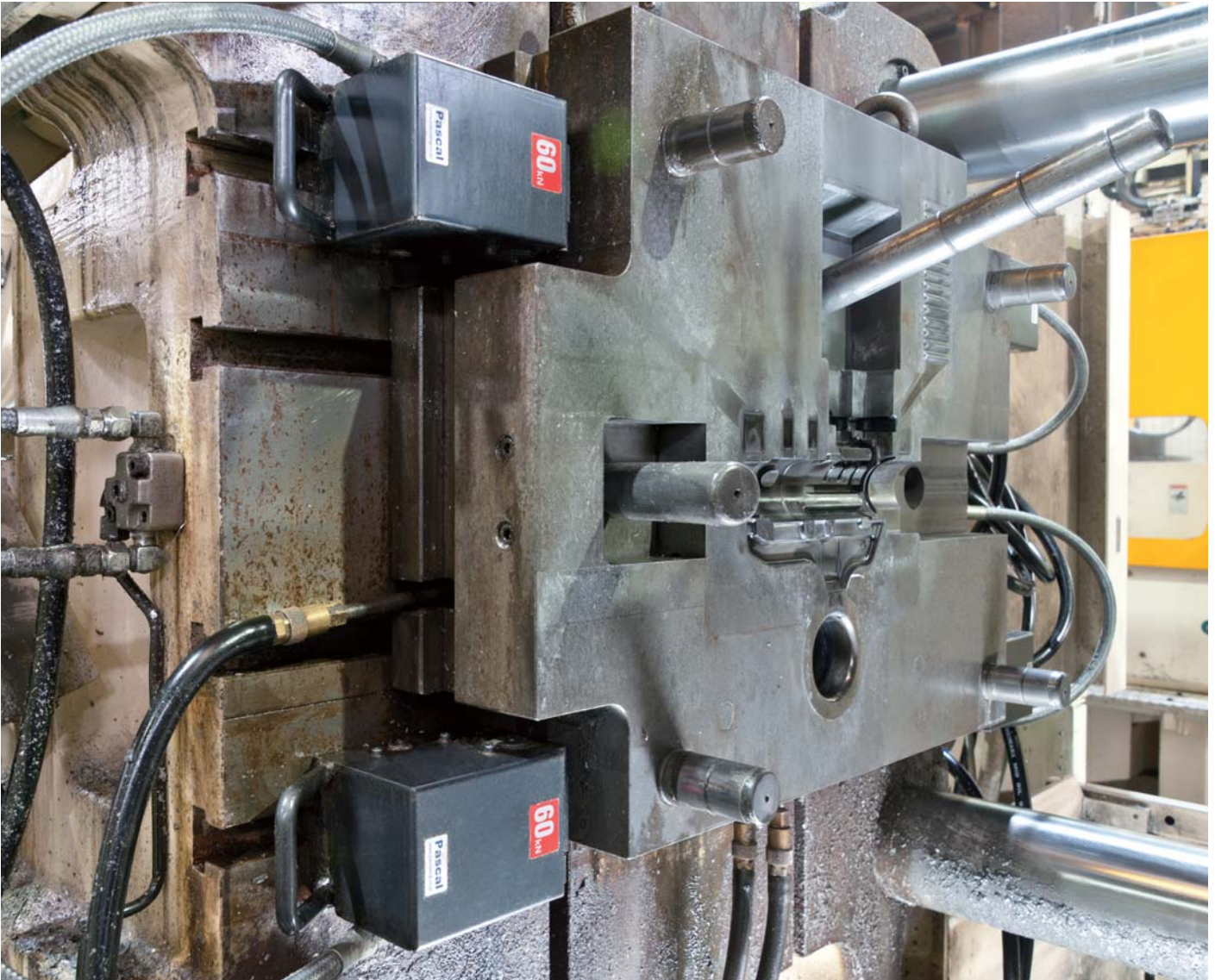


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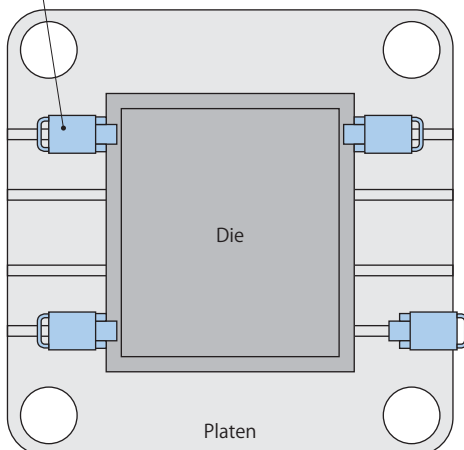
Pamphlet CL-002E REV.16 2016.11

## Installation on 3500kN die-casting machine



Manual slide clamp model TYB063

Clamping force :  $61.7 \text{ kN} \times 4 = 247 \text{ kN}$

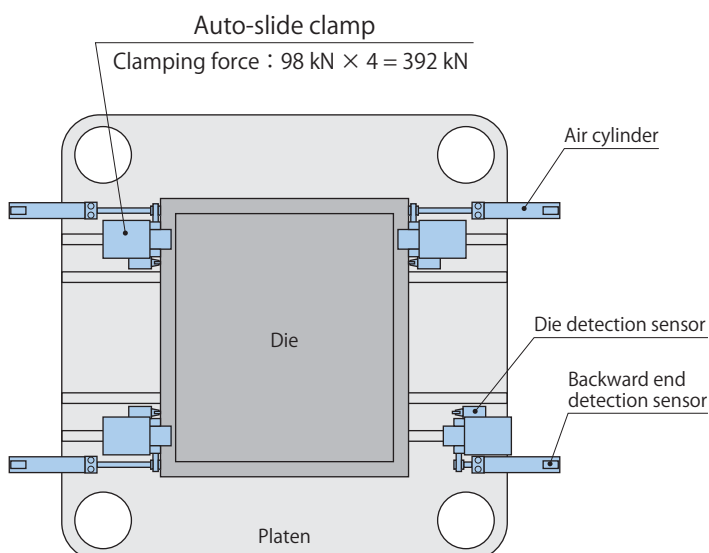
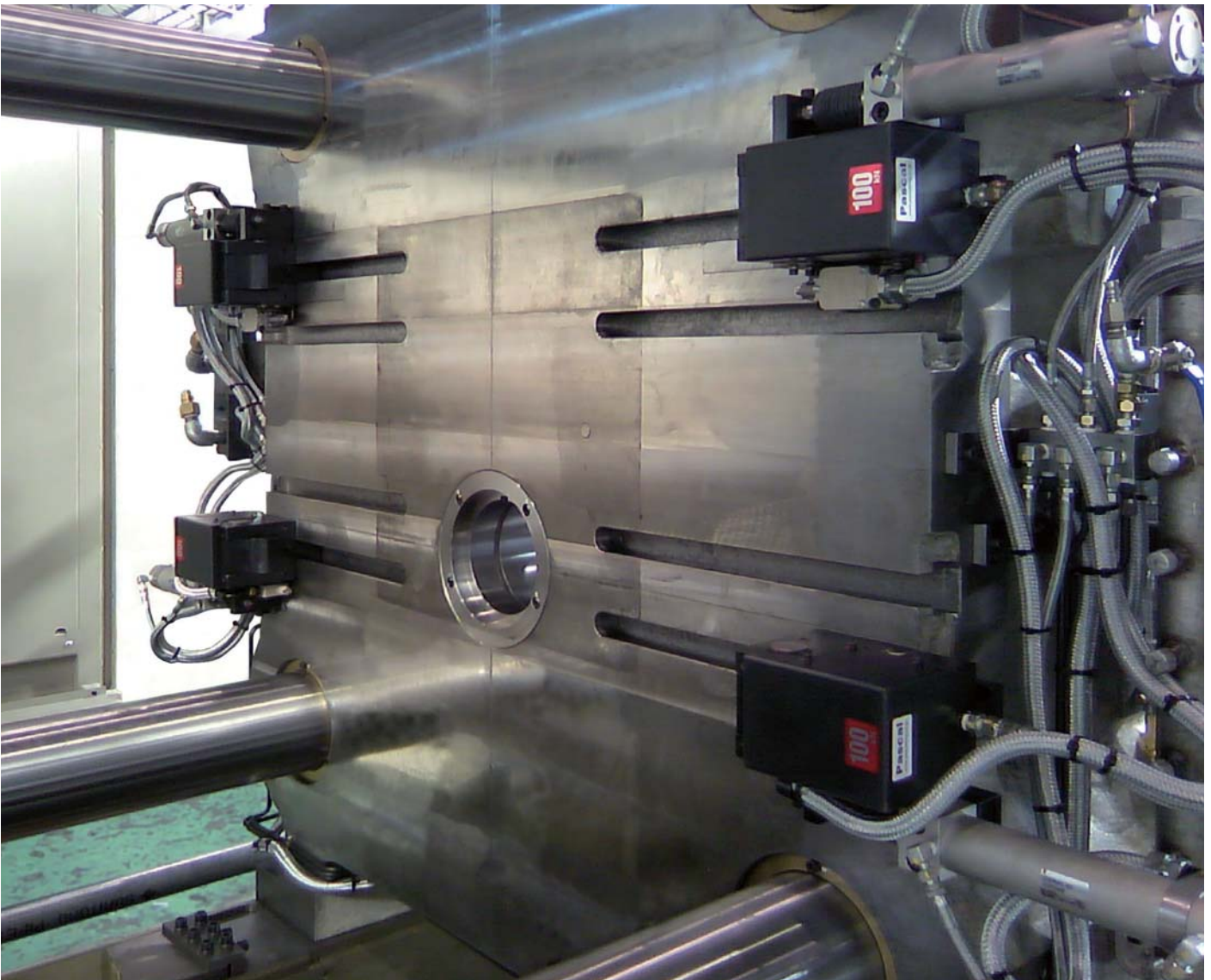


Pascal Clamp model TYB is a hydraulic lever clamp which is specifically developed for diecasting machines. TYB is designed based on our experiences and knowledge through 40 years of clamping business for stamping and injection molding machine.

Simple, rugged design assures high durability even under severe operating condition (Heat, Vapor, splash of release agent, etc.). Pascal has installed over 2000 machines from 1350 to 22500 kN, and our system contributed to increase of the productivity at customers' plant.



## Installation on 6500kN die-casting machine



Pascal auto slide type of TYB is also available. It is provided being equipped with a pneumatic cylinder to have clamp slid in the T-slot.

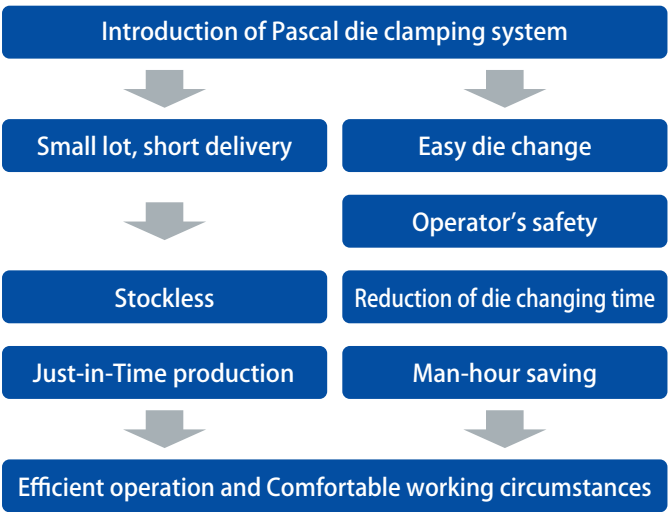
By depressing the button on the operation panel, the clamps automatically slide and clamp or unclamp in a matter of seconds, therefore, clamping operation is much easier than the one without a pneumatic cylinder.

In addition, die detection sensor and backward end detection sensor provided with clamp enable the system to build up safety interlocking with the machine control, which allows the die change operation safer and more sophisticated.

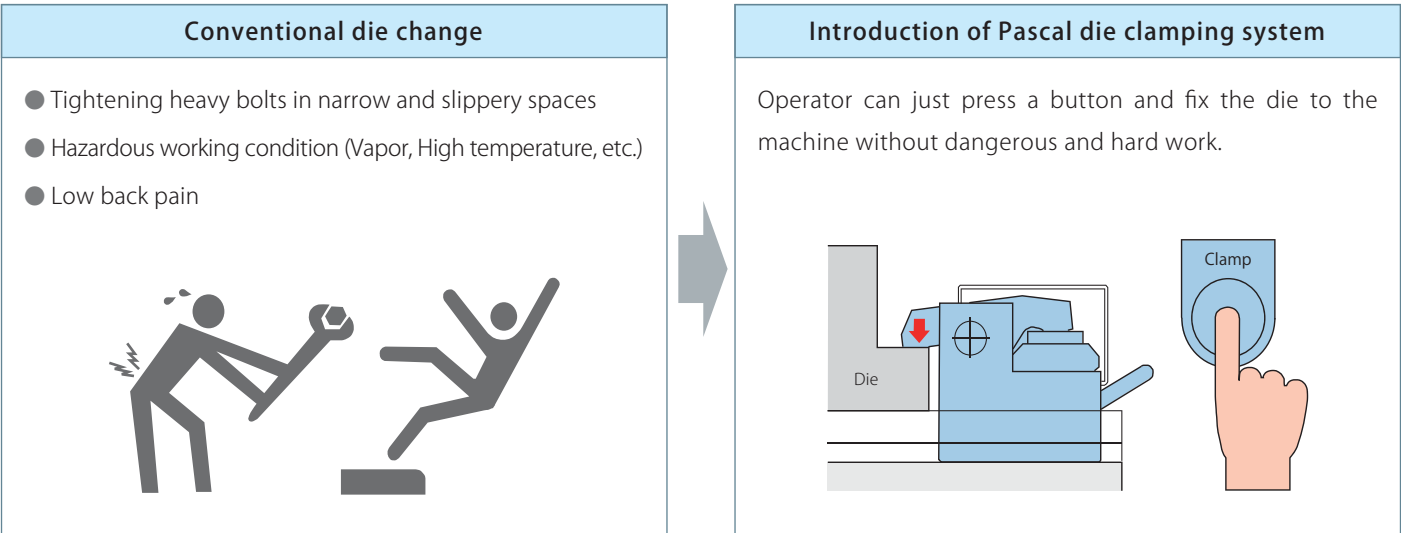
# Advantage of Pascal die clamping system

It is a must for the die casters that their plant operation be capable of compromising the needs of decreasing production lot and increasing variation of products, and at the same time shortening of delivery and lowering the production cost.

Pascal offers its reliable, durable, unique and cost efficient die clamping system in accordance with individual system requirements and customer specific conditions.

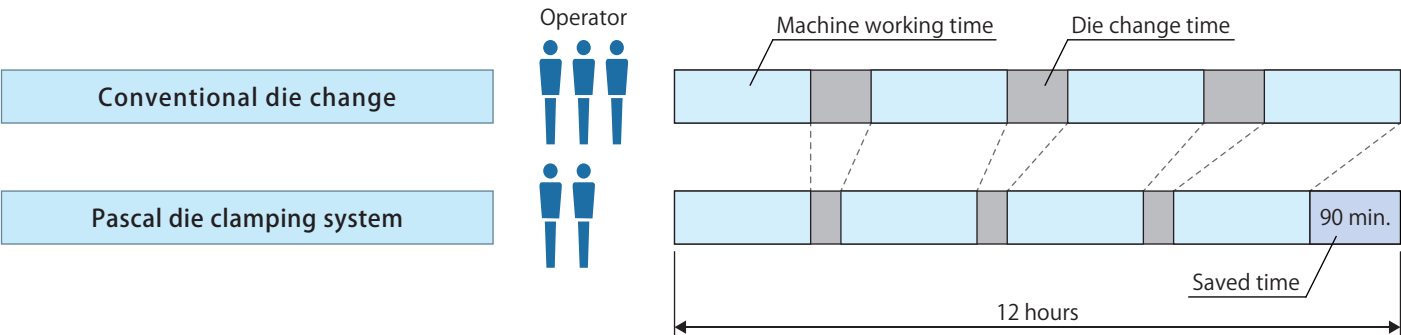


## Advantage 1



## Advantage 2

As a typical example, introduction of Pascal die clamping system could reduce the die change time from 60 minutes to 30 minutes.



## Construction and features of Pascal Clamp model TYB

Assures high durability and reliability even under severe operating condition (Heat, vapor, splash of release agent, etc.).

- Long clamping stroke : 10 ~ 12 mm
- Perfect protection against dust or die release agents
- Best solution for heat and corrosion
- Clamping force : 4, 6, 10, 16, 25 tonf



### Dust seal

### Grease nipple

For lubrication for clamp lever and shaft (Option)

### Long clamping stroke

Can accommodate big tolerance of clamping height and T-slot dimensions

### Lever shaft

Ion-Nitriding

### Dust cover

Protect from vapor, release agent's splash and foreign materials

### Dust seal

### Ram-cylinder

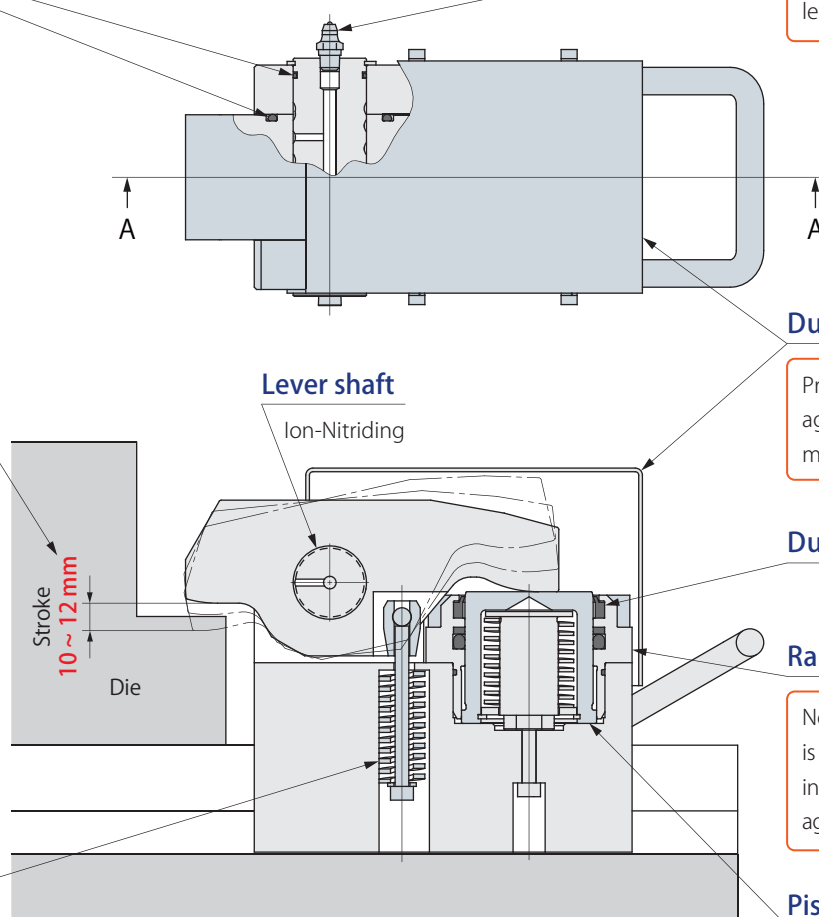
Non-breathing ram cylinder is adopted. It can protect the intrusion of dusts or release agents. (Ion-Nitriding)

### Return spring

Durable return spring is located at dust and vapor free area of the clamp body so that it can exert a stable pulling force.

### Piston

It is hard chrome plated, which enhances abrasion and corrosion resistance performance.



# Data of Pascal Clamp model TYB

## Specifications

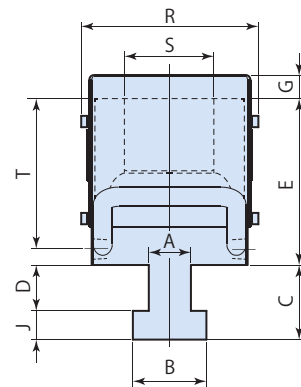
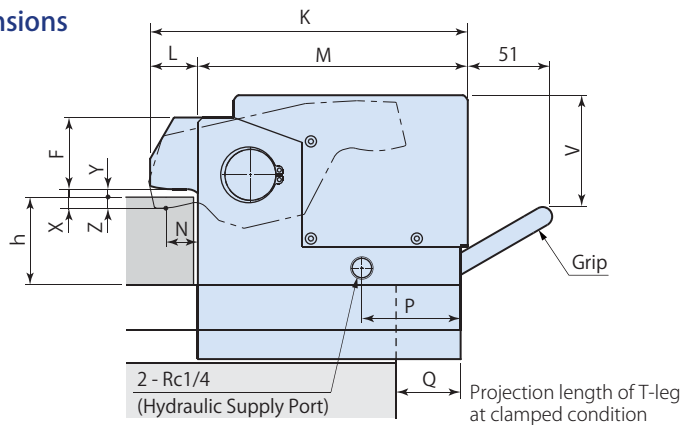
Model	TYB040	TYB063	TYB100	TYB160	TYB250
Clamping force at hydraulic pressure 24.5 MPa (kN)	39.2	61.7	98.0	156	245
Full stroke : X (mm)	10	10	12	12	12
Clamping stroke : Y ※1 (mm)	4	4	4	4	4
Safety stroke : Z ※1 (mm)	6	6	8	8	8
Cylinder capacity at full stroke (cm <sup>3</sup> )	16.5	26.1	47.2	78.2	130
Mass ※2 (kg)	4.5	9	15	25	45

Proof pressure : 36.7 MPa Working temperature range : 5 ~ 120 °C

※1. Clamping stroke and safety stroke shown above are the standard. Strokes are subject to change based on dimensions of die and T-slot.

※2. Mass varies according to the dimension of T-slot or "h" dimension.

## Dimensions



Dimensions "A, B, C, D, J" to be determined based on T-slot dimensions.

(mm)

Model	F (h) ※1	G	K	L	M	N	P	MAX. Q ※2	R	S	T	V	MIN. E	MIN. J ※3	MIN. h ~ MAX. h ※4
TYB040	27.5 (43 ≤ h) 32.5 (38 ≤ h < 43) 37.5 (33 ≤ h < 38)	13	145	23	122	16	32.5	32	83	39.6	64.5	-	74.5	Standard : 10.5 S1 : - S2 : 9	33 ~ 50
TYB063	29.5 (48 ≤ h) 39.5 (38 ≤ h < 48) 49.5 (28 ≤ h < 38)	13	168	30	138	20	38	36	103	49.6	71.5	58	81.5	Standard : 14 S1 : 11.4 S2 : 9.5	28 ~ 60
TYB100	45 (56 ≤ h) 55 (46 ≤ h < 56) 65 (36 ≤ h < 46)	14	200	30	170	20	62	45	113	54.6	94.5	76	105	Standard : 16 S1 : 13 S2 : 11	36 ~ 70
TYB160	60 (58 ≤ h) 70 (48 ≤ h < 58) 80 (38 ≤ h < 48)	15	235	30	205	20	80	55	133	59.6	110	96	122	Standard : 19 S1 : 15.5 S2 : 13	38 ~ 80
TYB250	106 (58 ≤ h) 116 (48 ≤ h < 58) 126 (38 ≤ h < 48)	20	285	35	250	20	95	65	168	72	156	118	168	Standard : 26 S1 : 21.5 S2 : 18	38 ~ 88

※1. "F" dimension to be determined by "h" dimension.

※2. There are cases when the projection length of T-leg exceeding the Max. Q figure may be used according to the T-slot dimensions. In such case, ask us for details.

※3. Dimension varies according to the material of the body. (Standard : SS400、S1 : S45C、S2 : SCM435)

※4. Special specifications prepared in case "h" dimension is out of the range.

## Selection of clamping system

Die locking force of machine	Clamp		Hydraulic control unit (See Page 7)
	Model × Quantity ※1	Total clamping force ※2	
~ 2000 kN	TYB040 × 8	156 kN	HCSD-HG2SSS HCLD-HG2SSS
~ 3500 kN	TYB063 × 8	246 kN	
~ 5500 kN	TYB100 × 8	392 kN	
~ 8500 kN	TYB160 × 8	624 kN	
~ 13000 kN	TYB250 × 8 (TYB160 × 12)	980 kN (936 kN)	HCLD-HG22SSS
~ 20000 kN	TYB250 × 12 (TYB160 × 16)	1470 kN (1248 kN)	
~ 26000 kN	TYB250 × 16	1960 kN	

※1. Quantity for one machine.

※2. Clamping force per platen. Inquire the clamp selection, when the actual die opening force is greater than above value.

## Model designation

**TYB** [Clamping force] - [Option symbol]

Option symbol

**D** : With dust cover

**G** : With grip

**N** : NPT port

**P** : With grease nipple

**S1** : Body material S45C

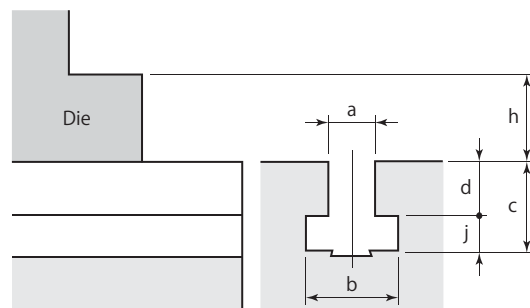
**S2** : Body material SCM435

**V** : Viton seal

## Data of Pascal Clamp model TYB

### T-slot dimensions and clamping height

- Specify T-slot dimensions "a, b, d, j" and clamping height (sub-plate thickness) "h".
- Regarding "d" dimension  
Retrofit : Specify to 0.1 mm.  
New machine : Machining tolerance shall be  $\pm 0.2$  mm or better.
- Recommended T-slot dimensions are shown in the following table.
- Minimum T-slot dimensions are also shown. Contact Pascal if your T-slot dimensions are less than these figures.



(mm)

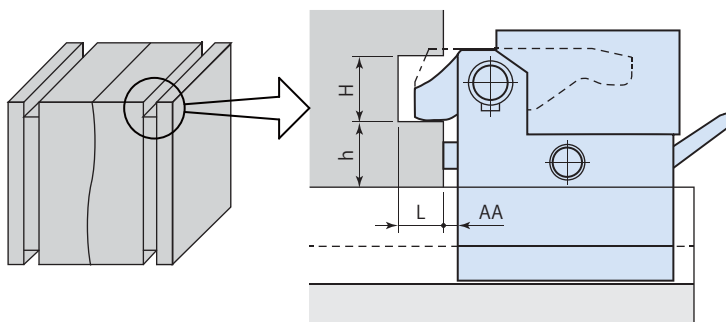
Model	Recommended T-slot dimensions				Minimum T-slot dimensions		
	a	b	d	j	a	d	j
TYB040	22 $^{+0.5}_0$	37 $^{+0.5}_0$	22 $\pm 0.2$	16 $^{+0.5}_0$	15	14	11.5
TYB063	28 $^{+0.5}_0$	46 $^{+0.5}_0$	28 $\pm 0.2$	20 $^{+0.5}_0$	19	16	15
TYB100	28 $^{+0.5}_0$	46 $^{+0.5}_0$	28 $\pm 0.2$	20 $^{+0.5}_0$	23	18	17
TYB160	32 $^{+0.5}_0$	53 $^{+0.5}_0$	28 $\pm 0.2$	24 $^{+0.5}_0$	27	21	20
TYB250	36 $^{+0.5}_0$	56 $^{+0.5}_0$	32 $\pm 0.2$	30 $^{+0.5}_0$	32	29	27

### Clamp area details (Groove)

To accommodate the clamp to the die as shown on the right, Pascal can provide special designed clamp lever with the clamp.

Specify the dimension H, L and h of the die when ordering.

The figures shown in the column L and H in the table are a minimum dimension to make.



(mm)

Model	MIN. H							MIN. L	AA
	20 $\leq h < 25$	25 $\leq h < 30$	30 $\leq h < 35$	35 $\leq h < 40$	40 $\leq h < 45$	45 $\leq h < 50$	50 $\leq h$		
TYB040	20	25	25	25	-	-	-	15	10
TYB063	-	25	30	30	30	-	-	20	12.5
TYB100	-	35 (30)	35	35	40	-	-	20	12.5
TYB160	-	-	-	-	40 (30)	40 (30)	45 (35)	25 (20)	10 (12.5)
TYB250	-	-	-	-	-	-	50	30	10

### Option (The following models are available as the options. Contact Pascal for more information.)

- With die detection limit switch



- Auto slide type

Model TYB with air cylinder for sliding function. The clamp can go forward or backward by a switch on operation panel so that die change operation time can be shortened further.



## Data of Pascal control unit model HCS



Model HCS is a power pack unit consisting of Pascal pump and air solenoid operated non leak valve with oil tank.

Its compact design can fit in limited space of the machine.

Model	HCS ① - HG2 ③ - ④
Pump model × Quantity	X6308UG × 1
Discharge pressure	24.5 MPa
Driving air pressure	0.47 MPa
Discharge volume at no load	1.3 L/min
Oil tank capacity	LOWER 1.5 L / UPPER 3.5 L

Fluid used : Water glycol system working oil      Operating temperature : 5 ~ 50°C

Air consumption rate : MAX. 0.4 Nm<sup>3</sup>/min.

### Specifications

**HCS ① - H ② ③ - ④**      ex : HCSD-HG2SSS-U

#### ① Control voltage (for Solenoid valve)

Symbol	Voltage
D	DC24V

In case of other solenoid valve voltage, ask us separately.

In case of AC voltage, no CE or UL compliance type is available.

#### ② Pascal pump model

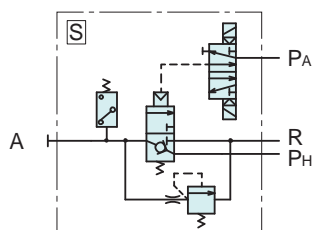
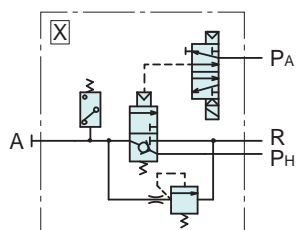
Symbol	Pump model × Quantity
G2	X6308UG × 1

For the use of mineral oil, ask us separately.

#### ③ Hydraulic circuits

Symbol	Remark
X	Single solenoid + relief valve
S	Double solenoid + relief valve

For other circuit symbols, ask us separately.



#### ④ Option

Symbol	Item
U	Oil pressure gauge for each circuit

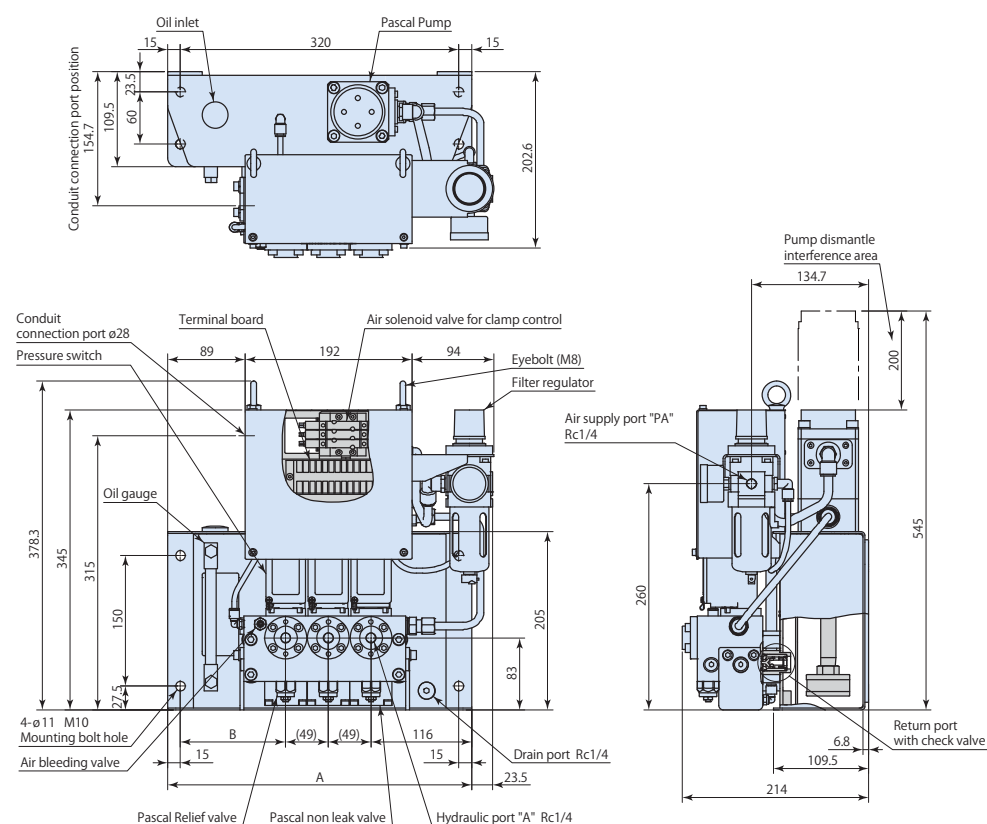
Number of Clamp circuit		Pascal pump Model x Quantity	Control unit model	
Stationary side	Movable side		Single solenoid valve	Double solenoid valve
1		X6308UG × 1	HCSD-HG2X	HCSD-HG2S
1	1	X6308UG × 1	HCSD-HG2XX	HCSD-HG2SS
1	2	X6308UG × 1	HCSD-HG2XXX	HCSD-HG2SSS
2	2	X6308UG × 1	HCSD-HG2XXXX	HCSD-HG2SSSS

For other special specifications, ask us separately.

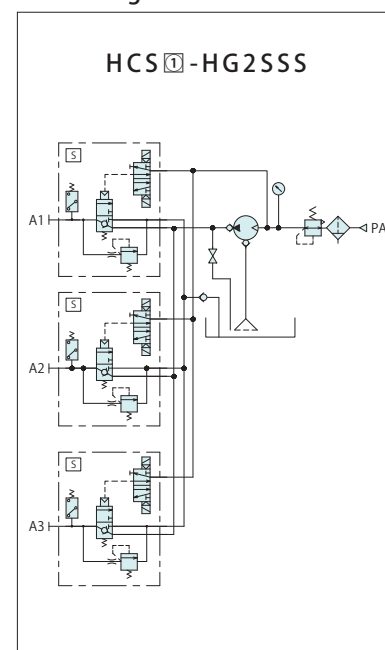


# Data of Pascal control unit model HCS

## Dimensions



## Circuit diagrams



Number of Hydraulic circuit	A (mm)	B (mm)	Mass (kg)
1	350	234	18
2	350	185	21
3	350	136	24
4	400	137	27

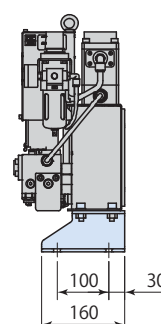
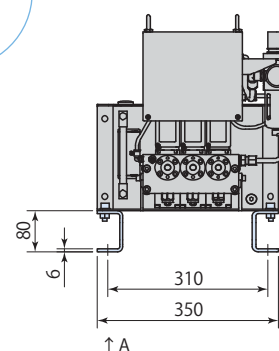
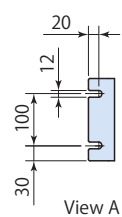
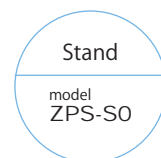
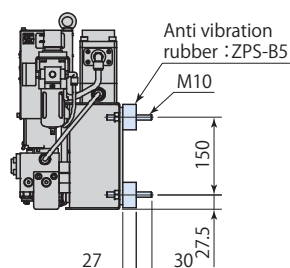
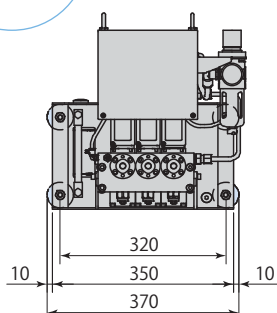
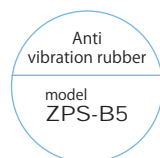
Model HCL should be chosen in case of the following cases.

1. Double pump type is required.
2. The signal of Abnormal high pressure is required for interlocking.
3. More than five circuits of hydraulic valve are required.

Diagrams shown in this page are for 1 to 3 hydraulic circuits.

For 4 circuits application, ask us for details.

## Accessories for model HCS Unit (Option)



## Data of Pascal control unit model HCL



Model HCL is a power pack unit consisting of Pascal pump, non leak valve and large oil tank, which is ideal power source for mid and large size of machine. Double pump type is also available on this model to shorten the cylinder actuation time.

Model	HCL ① - HG2 ③ - ④	HCL ① - HG22 ③ - ④
Pump model × Quantity	X6308UG × 1	X6308UG × 2
Discharge pressure	24.5 MPa	
Driving air pressure	0.47 MPa	
Discharge volume at no load	1.3L/min	2.6L/min
Oil tank capacity	LOWER 2.2 L / UPPER 5.4 L	

Fluid used : Water glycol system working oil      Operating temperature : 5 ~ 50°C  
Air consumption rate : MAX. 0.4 Nm<sup>3</sup>/min. (Single pump)      MAX. 0.8 Nm<sup>3</sup>/min. (Double pump)

### Specifications

**H C L ① - H ② ③ - ④**      ex : HCLD-HG22SSS-L

#### ① Control voltage (for Solenoid valve)

Symbol	Voltage
D	DC24V

DC24V only available.

#### ② Pascal pump model

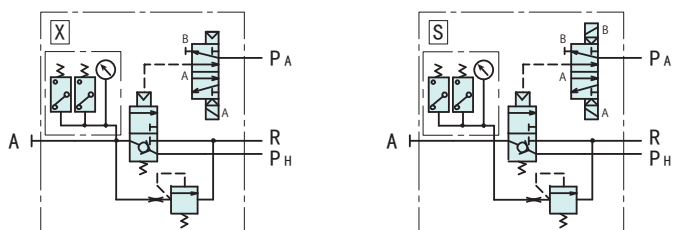
Symbol	Pump model × Quantity
G2	X6308UG × 1
G22	X6308UG × 2

For the use of mineral oil, ask us separately.

#### ③ Hydraulic circuits

Symbol	Remark
X	Single solenoid + relief valve
S	Double solenoid + relief valve

For other circuit symbols, ask us separately.



#### ④ Option

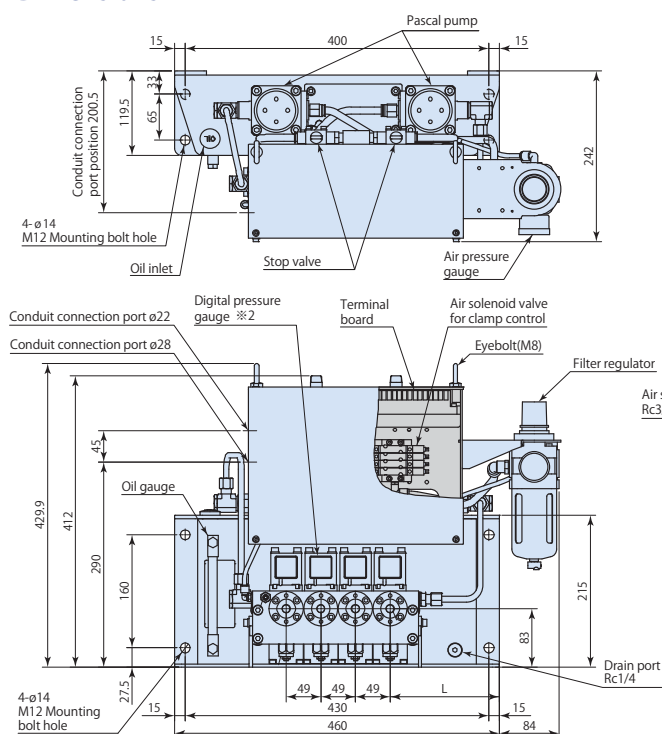
Symbol	Item
L	Low oil level detection switch
T2	2 position double solenoid air valve × 2 (for vertical clamp slider and mold positioning pin)
T3	3 position exhaust center double solenoid air valve × 2 (for horizontal clamp slider)

Number of Clamp circuit		Pascal pump Model x Quantity	Control unit model	
Stationary side	Movable side		Single solenoid valve	Double solenoid valve
1	2	X6308UG × 1	HCLD-HG2XXX	HCLD-HG2SSS
2	2	X6308UG × 1	HCLD-HG2XXXX	HCLD-HG2SSSS
1	2	X6308UG × 2	HCLD-HG22XXX	HCLD-HG22SSS
2	2	X6308UG × 2	HCLD-HG22XXXX	HCLD-HG22SSSS

For other special specifications, ask us separately.

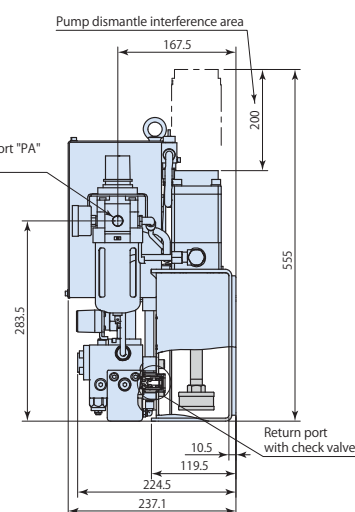
# Data of Pascal control unit model HCL

## Dimensions



Number of Hydraulic circuit	L (mm)	Mass (kg) ※1
1	204	26
2	179.5	29
3	155	32
4	155	34

※1. 1 unit of pump is included. 3 kg to be added when 2 pumps applied.

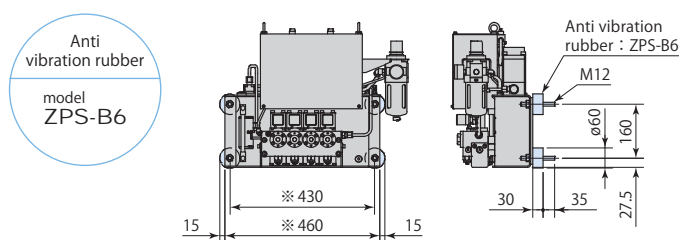


※2. Digital pressure gauge outputs the signal of pressure build-up and excessive high pressure.

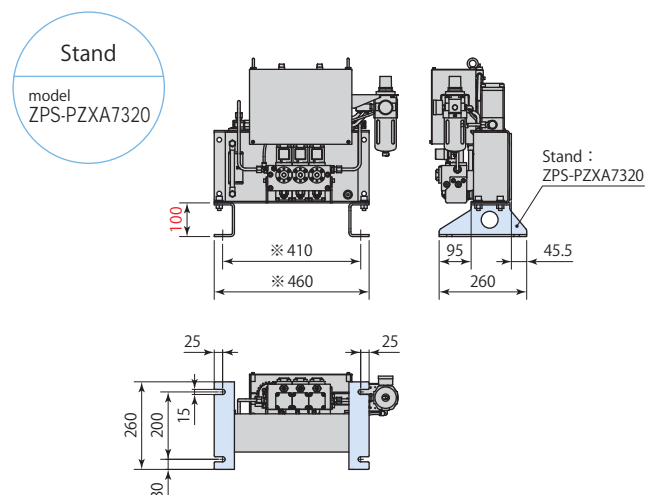
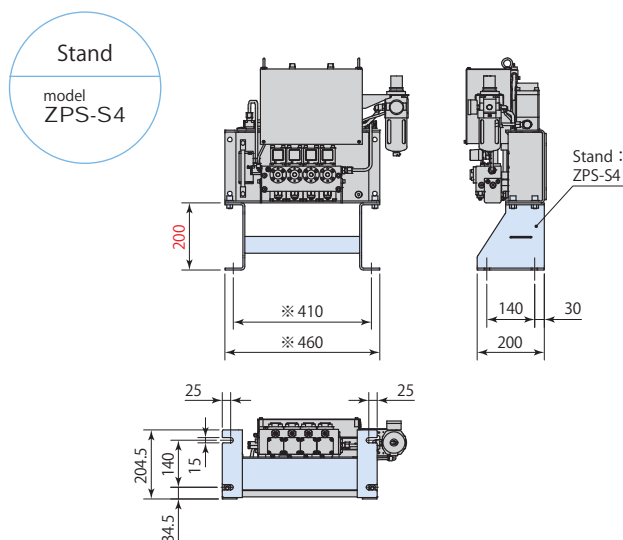
※3. Rc1/4 is for 1 pump type. Rc3/8 for 2 pumps.

Diagrams shown in this page are 1 to 4 hydraulic circuits. For 5 or more circuits application, ask us for details.

## Accessories for model HCL Unit (Option)



The dimensions marked ※ in the diagrams are for 1 to 4 circuits applications. For 5 or more circuits, the dimension increases by 50mm at every additional circuit.



## Operation panel & Control box

### Operation panel model EST-D

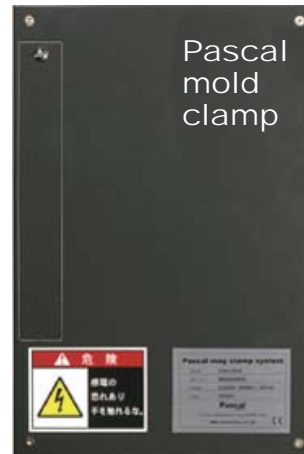
Clearly labeled user - friendly panel in compact body. Exclusively designed for die clamping system of die-casting machines.



Outline dimensions : W100 x H140 x D35 mm Mass : 0.6 kg

Ask us for the detail of dimensions and mounting brackets.

### Control box model ECT-D

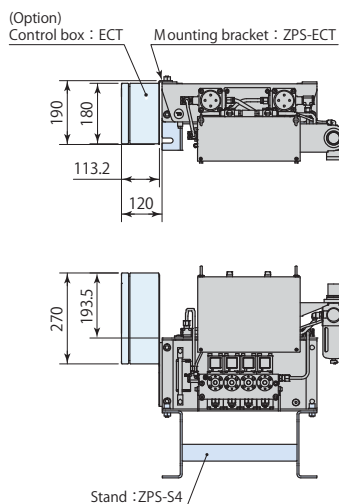


Outline dimensions : W180 x H270 x D110 mm Mass : 4.0kg

Ask us for the detail of dimensions and mounting brackets.

Control box  
mounting bracket

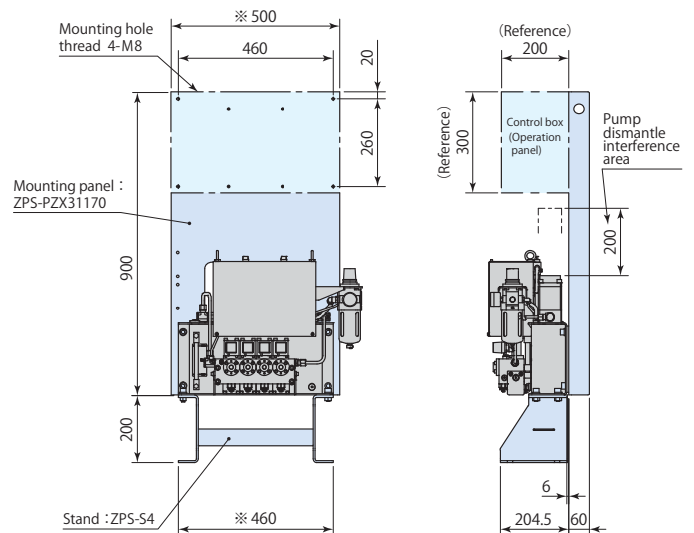
model  
ZPS-ECT



Control box  
mounting panel

model  
ZPS-PZX31170

The dimensions marked ※ in the diagrams are for 1 to 4 circuits applications. For 5 or more circuits, the dimension increases by 50mm at every additional circuit.



Specifications are subject to change without prior notice.

**Pascal corporation**

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