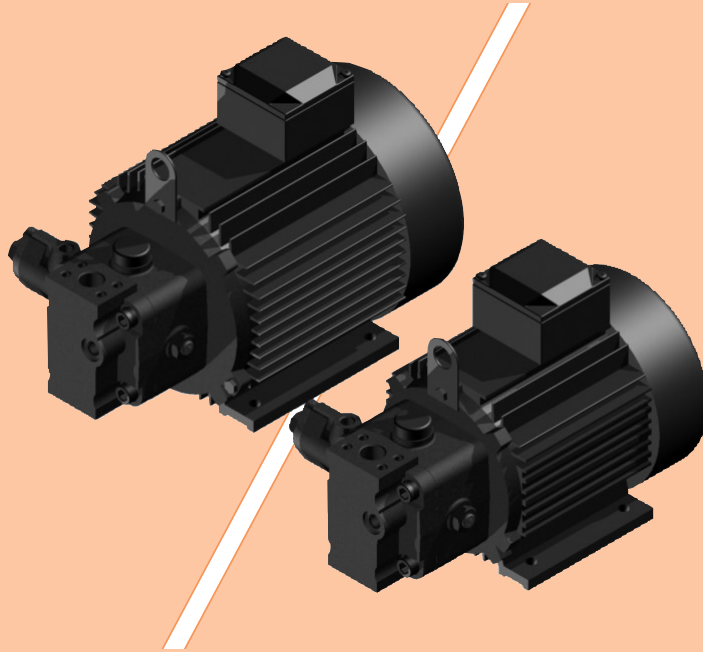


# PVM Series Variable Displacement Vane Pump - Motor



Type	KS Graphic Symbol	Geometric Displacement cm <sup>3</sup> /rev		Max. Operating Pres. MPa {kgf/cm <sup>2</sup> }	Page
		0	20		
PVM8-※-※-10		PVM-08	16	3.9 {40}	
PVM16-※-※-10		PVM-16	16	5.9 {80}	

## — Hydraulic Fluids for PVM series Variable Displacement Vane Pump-Motor —

### 1. Hydraulic Fluids

Use anti-wear type hydraulic oils or R & O (Rust and Oxidation inhibitor) type hydraulic oils (ISO VG-32 or 46) with a viscosity range of 20 to 400 mm<sup>2</sup>/s {cSt } at temperatures of 0 to 60 (32 to 140 ) both to be satisfied.

### 2. Control of Contamination

Due caution must be paid to maintaining control contamination of the operating oil which can otherwise lead to breakdowns and shorten the life of the unit. Please maintain the degree of contamination within NAS Grade 10. The suction port must be equipped with at least a 100 μm(150 mesh) reservoir type filter and the return line must have a filter of under 25 μm.

## — Precautions when using the PVM series Variable Displacement Vane Pump-Motor —

### 1. Mounting

Please use eyebolt when moving the pump. When moving it, do not give a strong shock by dropping or bumping. Please use the foundation strong enough to support it, and should be installed on the so that the horizontal axis.

### 2. Alignment of Shaft

It is using couplings to connect pump and motor, concerning the structure of the joint, so that separate shaft alignment is not required. Don't worry about noise or vibration due to defect of alignment shaft and it is safe because the rotating part is not exposed.

### 3. Suction Pressure

Permissible suction pressure at inlet port of the pump is between -0.03 ~ + 0.03 Mpa {- 0.3 ~ +0.3 kgf/cm<sup>2</sup>}. For piping to the suction port, use the pipes of the same diameter as that of the specified pipe flange to be used. Make sure that the height of the pump suction port is within one meter from the oil level in the reservoir.

### 4. Hints on Piping

When using steel pipes for the suction or discharge ports, excessive load from the piping to the pump generates excessive noise. Whenever there is fear of excessive load, please use rubber hoses.

### 5. Suction Piping

In case the pump is installed above the oil level, the suction piping and suction line filter should be located lower than the pump position to prevent air in the suction line.

### 6. Drain Piping

Install drain piping according to the chart and ensure that pressure within the pump housing should be maintained at a normal pressure of less than 0.1 MPa{1 kgf/cm<sup>2</sup>} and surge pressure of less than 0.5 MPa{5.1 kgf/cm<sup>2</sup>}. Length of piping should be less than 1 m, and the pipe end should be submerged in oil.

#### [Recommended Drain Piping Size]

Size	Division	Piping Size
PVM8/16- ※ ※-10	Drain	Rc 1/4

## 7. Bleeding Air

It may be necessary to bleed air from pump case and outlet line to remove causes of vibration. An air bleed valve is recommended for this purpose.

## 8. Precautions when starting

When the first operation or not used for long time, the fluid cannot intake, so please install the air vent valve or loose the discharge side a little bit for air vent. To avoid the air bound, please adjust the hydraulic circuit so that the oil coming from the pump discharge go back to the tank, or by manipulating the direction switching valve actuator (cylinder or motor) to ensure that the no-load operation with. Besides, it takes time to boost during removal of the air in the pump or pipe. Even after about 5 minutes, if the pressure does not rise, please turn off the motor and check the wiring. The wire can be connected as opposite to the rotation. The direction of rotation is marked on the motor.

## 9. Setting Discharge Pressure and Delivery

Our pumps are shipped from the factory setting of the pressure to discharge pressure, because it is set to the maximum available to match again when the conditions of pressure and flow rate setting please.

Adjust the preset delivery and pressure to meet your system requirements.

### [Adjustment of Discharge Pressure]

Turning the adjustment screw clockwise, increases pressure. Volume adjusted by each full turn of the pressure adjustment screw and factory-set pressure is equal below the table. Please lock the nut after setting.

### [The Factory-set pressure and adjustable volume of each full turn of the pressure adjustment screw]

Model	Adjustable volume with each full turn of the adjustment screw MPa {kfa/cm <sup>2</sup> }	Factory-set pressure MPa {kgf/cm <sup>2</sup> }
PVM $\times$ -4- $\times$ -10	0.7{7}	3.4{35}
PVM $\times$ -6- $\times$ -10	0.7{7}	4.9{50}

### [Adjustment of Delivery]

Turning the delivery adjustment screw clockwise, decreases delivery. The minimum adjustable flow and adjustable volume of each full turn of the delivery adjustment screw is equal below the table. Please lock the nut after setting.

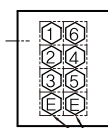
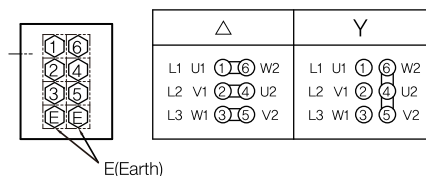
### [The Factory-set pressure and adjustable volume of each full turn of the pressure adjustment screw]

Model	Adjustable volume with each full turn of the adjustment screw (cm <sup>3</sup> /rev)	Minimum adjustable flow cm <sup>3</sup> /rev
PVM8- $\times$ - $\times$ -10	6.6	3
PVM16- $\times$ - $\times$ -10	6.6	8

## 10. Electric wiring

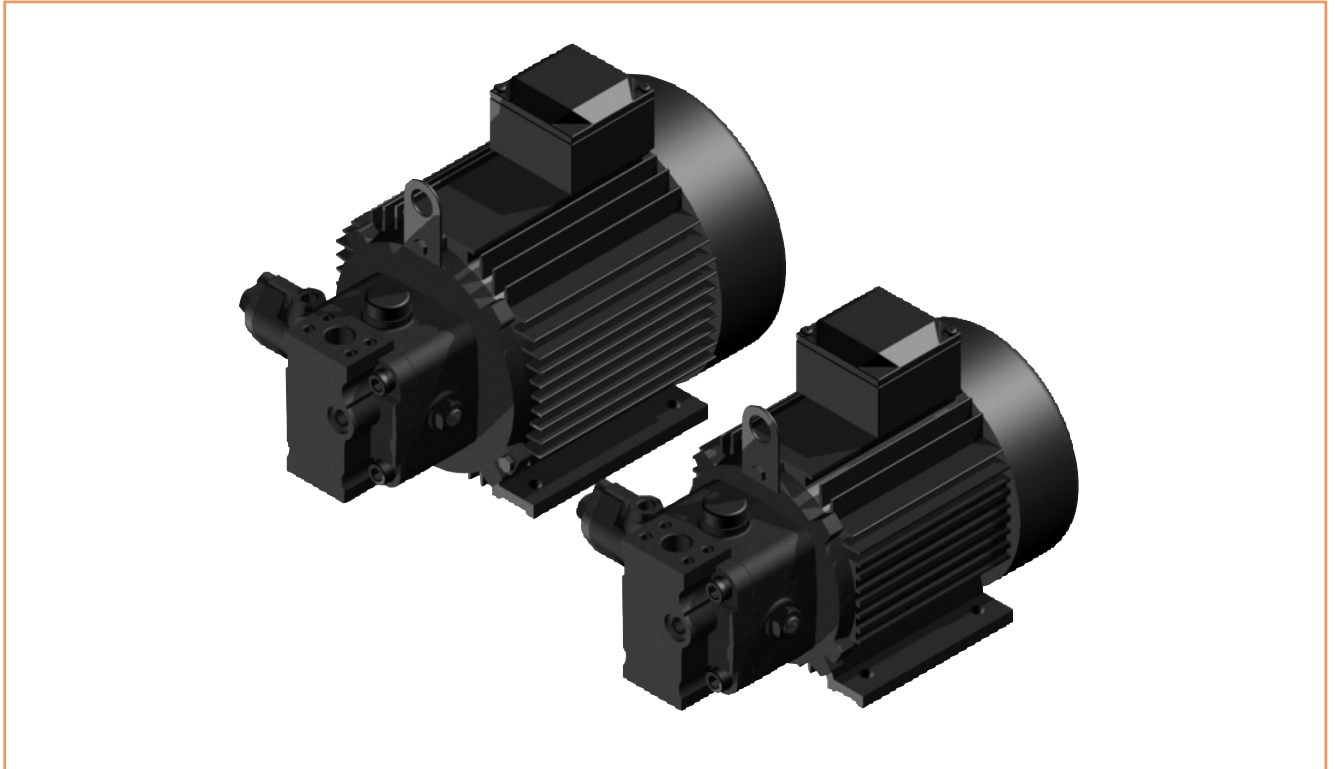
To protect electrical circuits and motor from over-electrical current and overload, we recommend that install the no-fuse circuit breaker within ground fault circuit interrupter. Please connect securely to prevent short circuit by using a proper size crimp terminals. Earth terminals must be installed.

### ● [Connection Diagram of terminal box (PVM $\times$ - $\times$ - $\times$ -10)]



E(Earth)

## PVM series Variable Displacement Vane Pump-Motor



### ■ Features and advantages

#### ● High efficiency

Variable vane pump is highly effective by reducing the external drain and optimizing the pressure balance.

#### ● Lightweight and compact

This, integrated product of the pump and motor, is lightweight and designed to compact, so it is easy to handle. Also the range of using is wide.

#### ● Energy savings

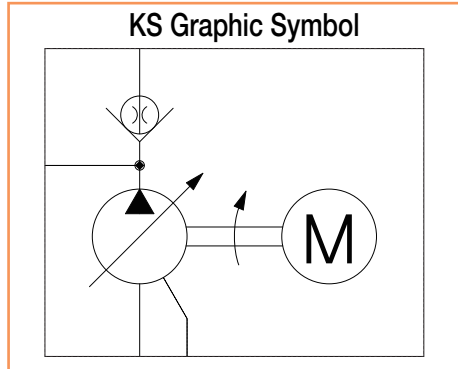
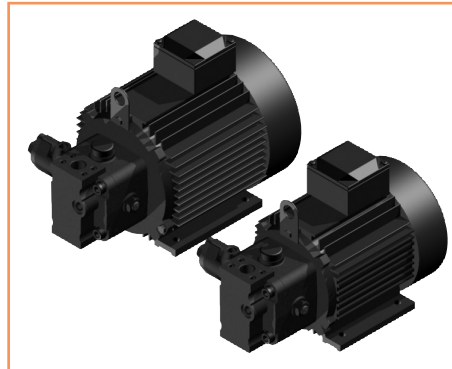
High efficiency contribute to energy savings and improve machining accuracy.

#### ● Low noise and Long lifetime

Connection of the pump and electric motor not affected shaft vibration and difference of alignment shaft by joint structures with oil lubricated shaft. Due to no wear shaft, improved low noise and long lifetime.

## PVM series Variable Displacement Vane Pump-Motor

### - Variable Displacement Vane Pump-Motor



#### ■ Ratings

Model Numbers	Geometric Displacement cm <sup>3</sup> /rev	Operating Pressure MPa {kgf/cm <sup>2</sup> }	Output Flow at no-load (lpm)	
			50 Hz	60 Hz
PVM8-4-※-10	8.1	1.5 ~ 3.9 {15 ~ 40}	12	14.5
PVM16-6-※-10	16.1	3.4 ~ 5.9 {35 ~ 60}	24	29

★1. Refer to the electric motor selection graph about available range of pressure & flow for electric motor output.

★2. When looking from the motor fan, clockwise rotation is standard.

#### ■ Model Number Designation

P	V	M	-08	-4	-H	-01	-10
Series Number	Pump type	Motor	Geometric Displacement cm <sup>3</sup> /rev	Pressure Adjustment Range MPa {kgf/cm <sup>2</sup> }	Type of Motor	Motor Output kw	Design Number
PUMP	V : Vane Pump	M : electric motor	8 : 8.1 16 : 16.1	4 : 1.5 ~ 3.9 {15 ~ 40} 6 : 3.4 ~ 5.9 {35 ~ 60}	None : Standard H : High Efficiency	01 : 0.75 02 : 1.5 03 : 2.2	10

#### ■ 3-Phase AC motor specifications

Motor	Output * Pole Number	Class of insulation	Voltage (V)	Frequency (Hz)	Rated Current (A)	Inrush Current (A)	Rotation at Rated Output (r/min)
Low Voltage	0.75 kw * 4P	F	200 / 200 / 220	50 / 60 / 60	3.8 / 3.6 / 3.5	18 / 17 / 19	1400 / 1700 / 1710
Standard	0.75 kw * 4P	F	220 / 380	50 (60)	4/2.4 (3.5/2.05)	20/11.5 (19/11)	1410 (1710)
	1.5 kw * 4P	F	220 / 380	50 (60)	7.1/4.1 (6.3/3.6)	42.5/24.5 (40/23.1)	1420 (1720)
	2.2 kw * 4P	F	220 / 380	50 (60)	11/6.4(9.1/5.3)	63/36.5(58/33.5)	1420 (1720)
High Efficiency	0.75 kw * 4P	F	220 / 380	60	3.4/2	18/10.5	1720
	1.5 kw * 4P	F	220 / 380	60	6.1/3.5	35/20.5	1720
	2.2 kw * 4P	F	220 / 380	60	8.6/4.96	60/34.6	1720

#### ■ Pipe Flange Kits

This products are not included Pipe Flange Kits. When ordering, specify the kit number from the table below.

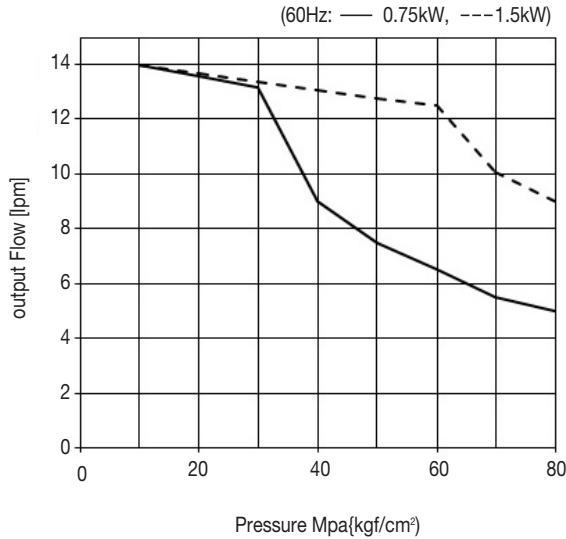
Model Numbers	Name of Port	Specification of Port
PVM ※-※-※-10	Suction	Rc 3/4
	Discharge	Rc 1/2 or SAE J518b 1/2
	Drain	Rc 1/4

## PVM Characteristics

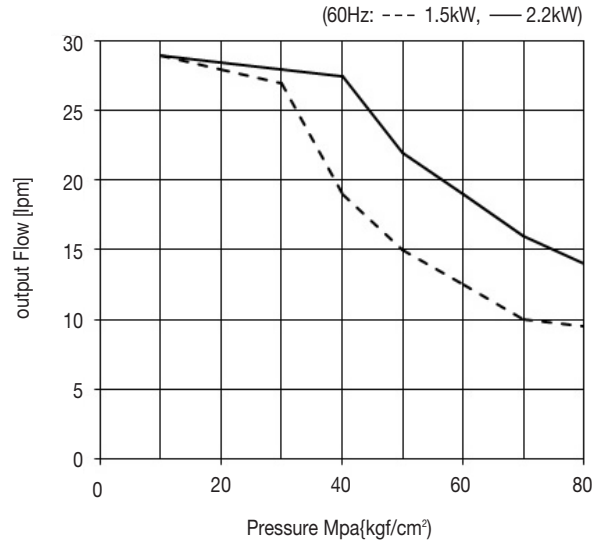
Bellow characteristics is typical performance at viscosity 20mm<sup>2</sup>/s(ISO VG 32 Oil, 40℃)

### Graph of Selection

#### ● PVM8-※-※-10



#### ● PVM16-※-※-10



$$\text{Total Efficiency } \eta_t = \frac{P \times Q}{612 \times Li} \times 100 (\%), \quad \text{Volumetric Efficiency } \eta_v = \frac{Q_p}{Q_0} \times 100 (\%)$$

\* Li : Input Power (kW)

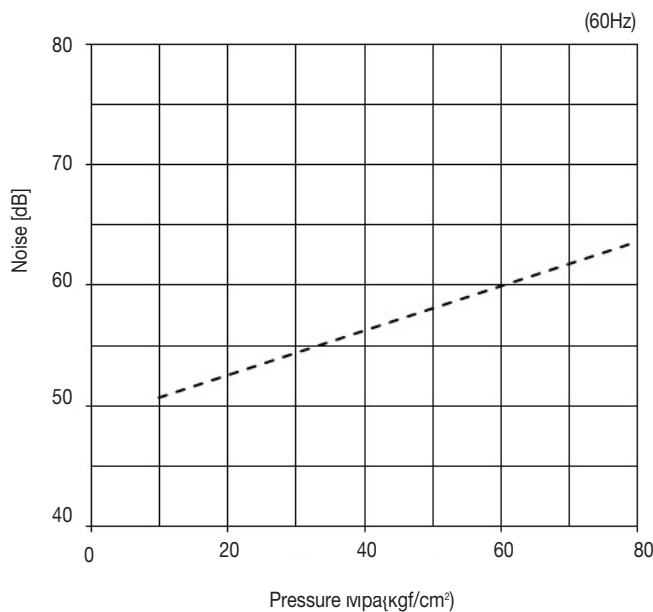
\* Q<sub>p</sub> : Output Flow at pressure P (L/min)

\* P : Pressure Discharge (kgf/cm<sup>2</sup>)

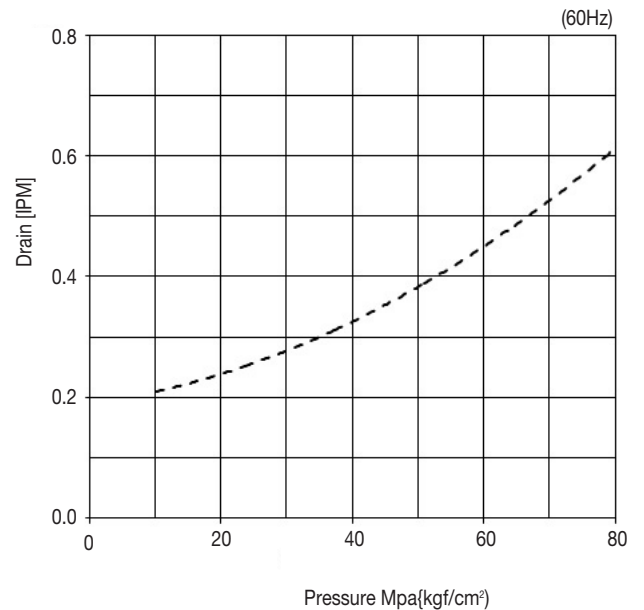
\* Q<sub>0</sub> : Output Flow at no-load (L/min)

\* Q : Out Flow (L/min)

### Noise Level at Full Cut-off



### Drain



\* One meter horizontally away from pump head cover

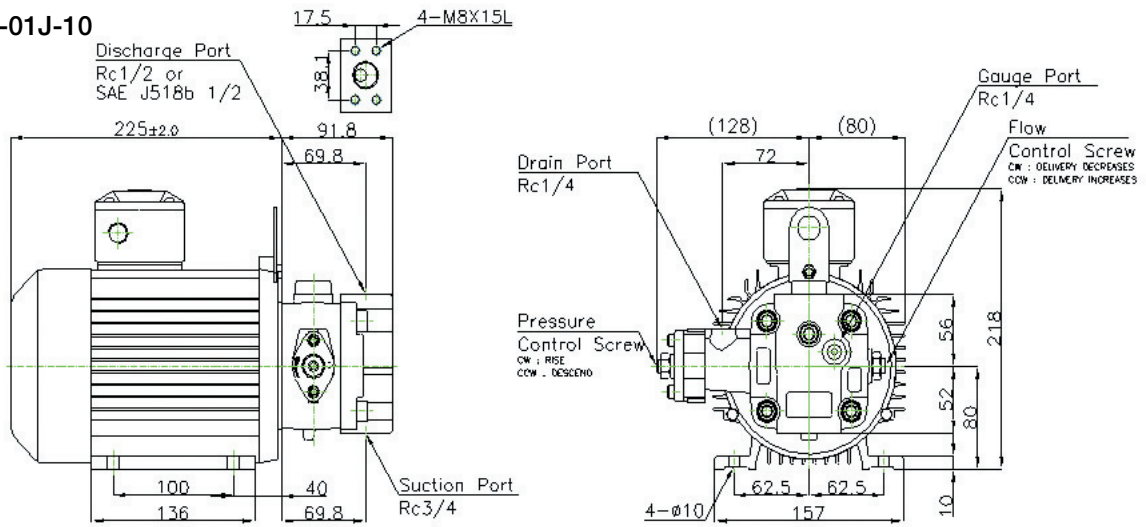
# VANE PUMPS

# B

PVM Series

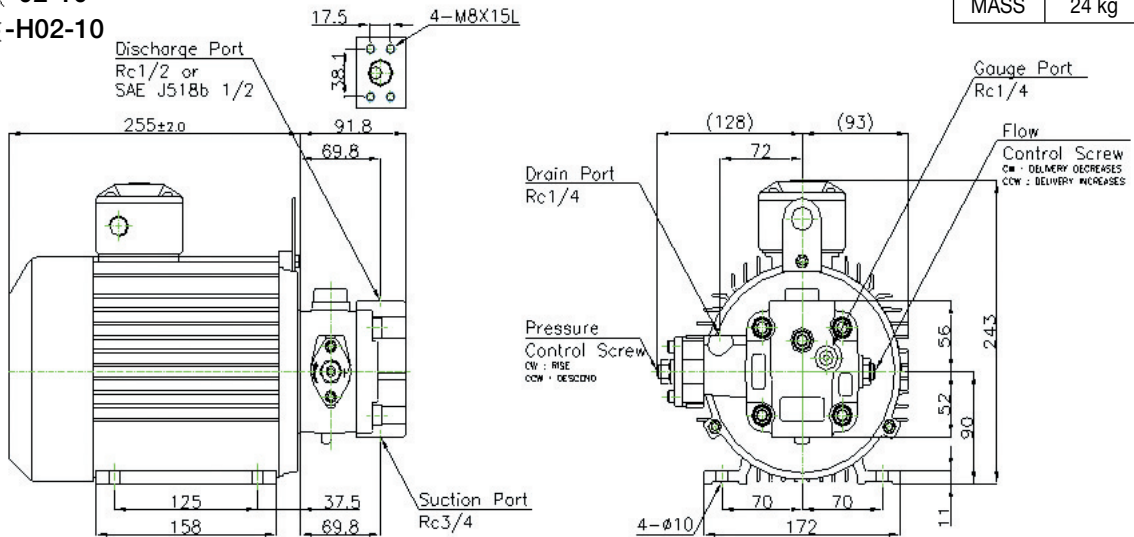
- PVM  $\times$ - $\times$ -01-10
- PVM  $\times$ - $\times$ -H01-10
- PVM  $\times$ - $\times$ -01J-10

MASS	21 kg
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- PVM  $\times$ - $\times$ -02-10
- PVM  $\times$ - $\times$ -H02-10

MASS	24 kg
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- PVM  $\times$ - $\times$ -03-10
- (PVM  $\times$ - $\times$ -H03-10)

MASS	27 kg (30 kg)
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