

PRECISION ADJUSTABLE FEED

Variax VGX Series



New type grip feed with adjustable release timing using a handle.



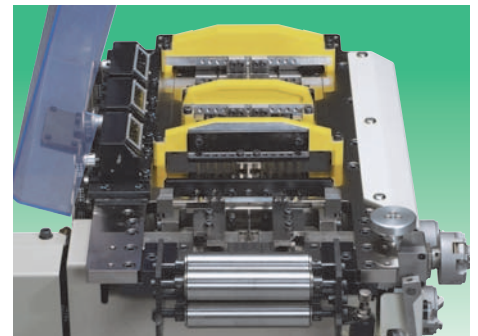
Variax **VGX** Series VGX30/60/100/350

Features

- Improved adjustment functions (added adjustment functions that use handles to set material thickness and the release position)
- Improved applicability for different material shapes and secondary processing of materials.
- When the material thickness setting is changed, the upper material guide does not need to be adjusted.
- By employing a gate-shaped gripping clamp arm, the material gripping force is improved and the feeding capacity is improved.

To make adjustments without tools, to make fine adjustments during operation, to supply material at creep speeds, the new cam-driven grip feed is exactly what you want. It was developed from the results and experience we have established to improve work safety and operate at high speed. In addition to the excellent features (high-speed, high-precision feeding, and hard to scarred materials) of the VG series, this series lets you adjust for material thickness, feed length, and release timing without needing any tools. Also, fine adjustments can be made during operation. These adjustments can be made with handles (or pushbuttons on the VGX350), and the current settings are displayed by mechanical counters, so that adjustment is truly easy. A grip parameter system is used to adjust the material thickness and gripping force, which means that parameter adjustments can be done simply and precisely, compared with existing models.

By improving the usability of the VG series, the VGX series are complete, high-functionality products that can handle a variety of material feed conditions. They have the features and advantages listed below.



Outline and Specifications

Specifications

Size	Units	VGX30	VGX60	VGX100	VGX350
Feed length	mm	0 to 30	0 to 60	0 to 100	**50 to 350
Minimum Increments for Feed Pitch	mm	0.005	0.005	0.005	0.01
Material thickness* ¹	mm	0.1 to 2	0.1 to 2	0.1 to 2	**0.1 to 1
Grip force	N	1700	1700	1700	5000
Roll width	mm	8 to 100	8 to 100	8 to 100	70 to 420
Maximum strokes	min ⁻¹	2000	1500	1000	300
Maximum feed rate	m/min	50	50	50	90
Feed angle	deg	156	165	165	165
Repeated feed accuracy* ²	mm	±0.025	±0.025	±0.025	±0.08
Pilot release	(°)	Approx. 51	Approx. 49	Approx. 49	**Approx. 46
Input Shaft Drive Ratio	rpm : s	1:1	*2:1	*2:1	*2:1
Operating air pressure	kPa	490 to 690	490 to 690	490 to 690	490 to 690
Lubricating oil pressure	kPa	290 to 490	290 to 490	290 to 490	290 to 490
Lude flow supply	ℓ/min	0.4	0.4	0.4	1.5 to 2.2
Lubrication		Forced lubrication	Forced lubrication	Forced lubrication	Forced lubrication
Operating power supply	V	100 VAC, single phase	100 VAC, single phase	100 VAC, single phase	100 VAC, single phase
Product weight	kg	95	95	95	750

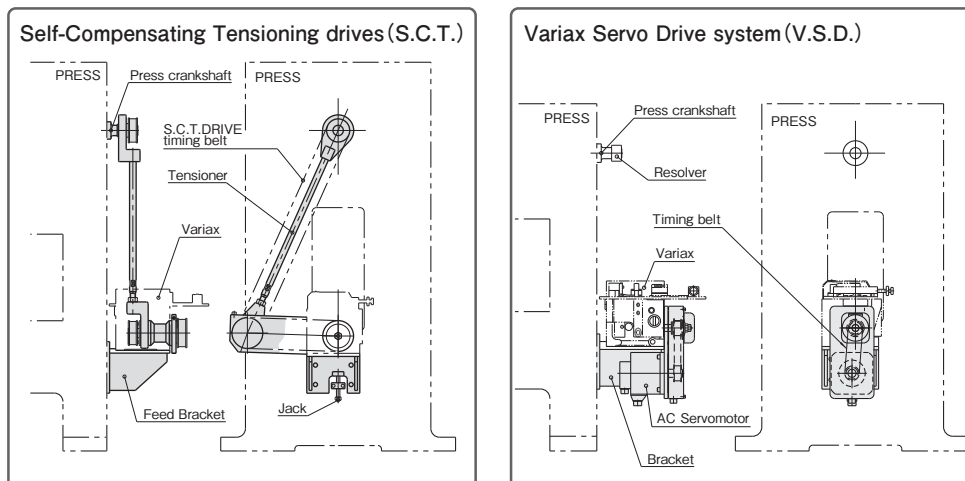
*Requires two turns of the input shaft to make one feed motion.

**On the VGX350, the adjustments for feed pitch, material thickness, and release position are push-button adjustments.

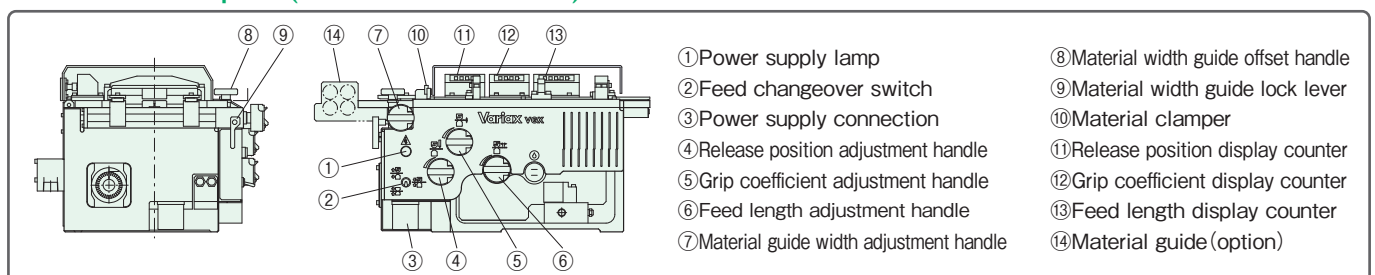
Note 1) If your material is over 1 mm thick, please contact our Sales Department.

Note 2) The feed precision depends on the operating conditions. The values given here are for reference purposes only.

Drive method



Name of each part (for VGX30/60/100)



Dimensions

[Unit:mm]

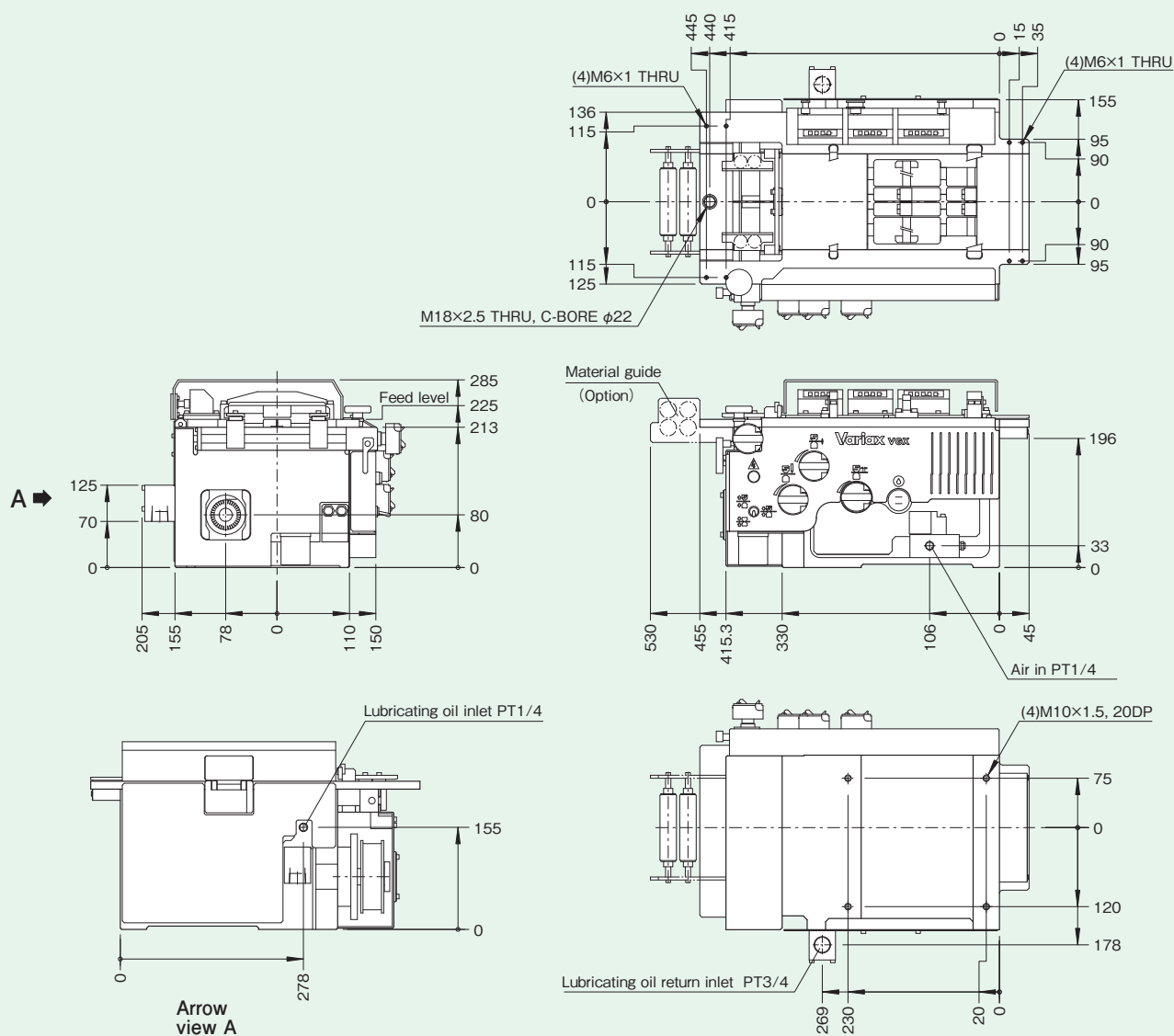


Figure VGX30-1

Specification table

Characteristic	Data
Feed length	0 to 30 [mm]
Material thickness	0.1 to 2*1 [mm]
Gripping force	1,700 [N]
Material width	8 to 100 [mm]
Maximum number of strokes	2000 [min^{-1}]
Maximum feed speed	50 [m/min]
Minimum Increments for Feed Pitch	0.005 [mm]
Feed Angle	156 [deg]
Repeatability	$\pm 0.025^{*2}$ [mm]
Pilot Release	Approx. 51 [deg]
Input Shaft Drive Ratio	1:1 [rpm:s]

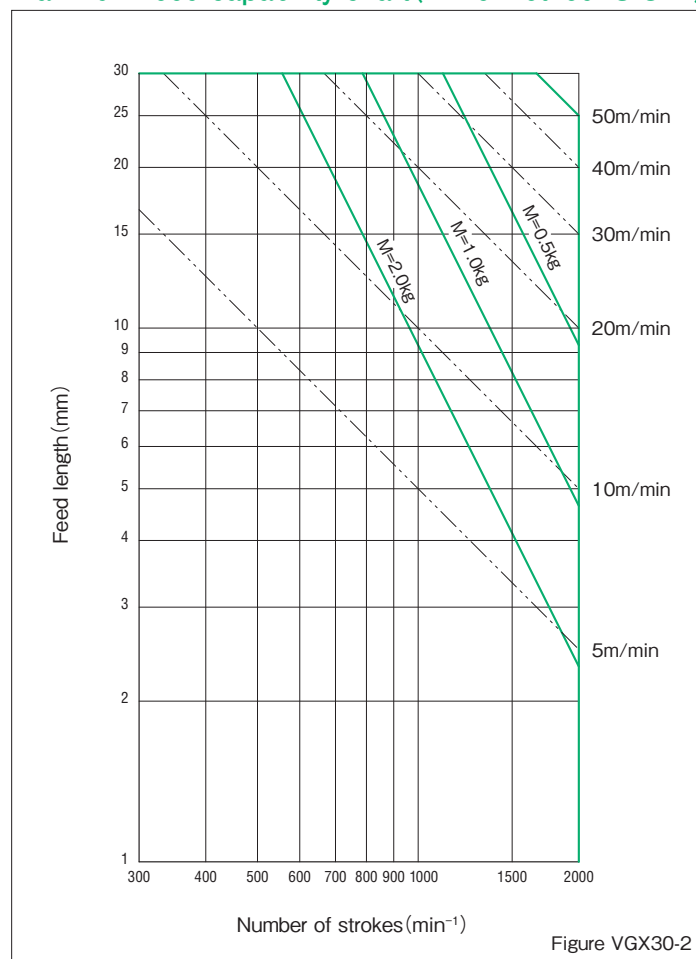
*1 If your material is over 1 mm thick, please contact our Sales Department.

*2 The feed precision depends on the operating conditions. The values given here are for reference purposes only.

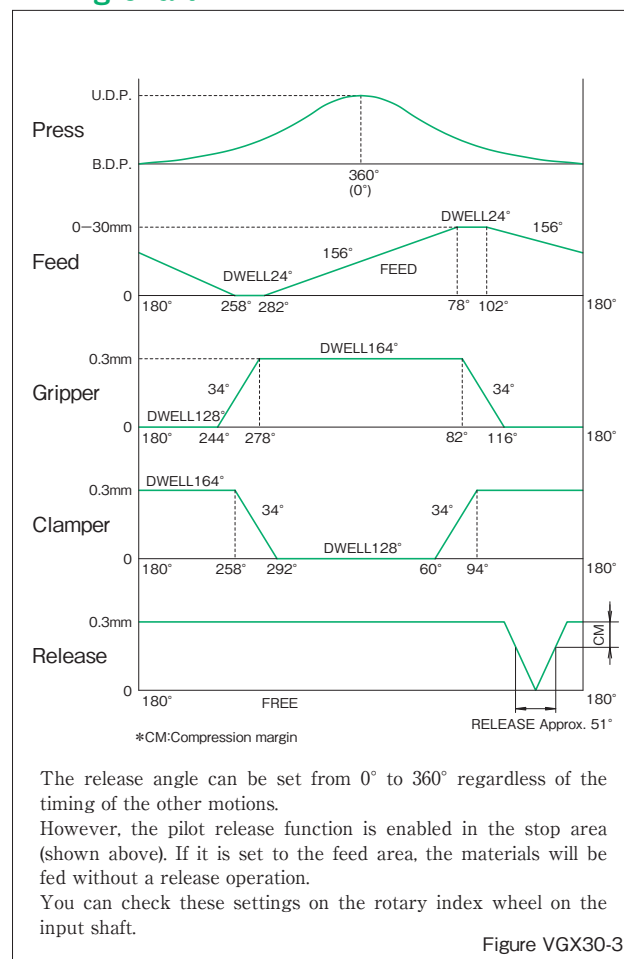
Characteristic	Data
Operating air pressure	490 to 690 [kPa]
Lubricating oil pressure	290 to 490 [kPa]
Lude flow supply	0.4 [ℓ/min]
Operating power supply	100 VAC single phase [V]
Product weight	95 [kg]
Recommended lubrication oil	Shell Omala S2 G 68
Lubrication system	Forced lubrication
Housing color	5Y7/1
Operation panel color	2.5Y9/0.2

1[N·m] \approx 0.102[kgf·m]

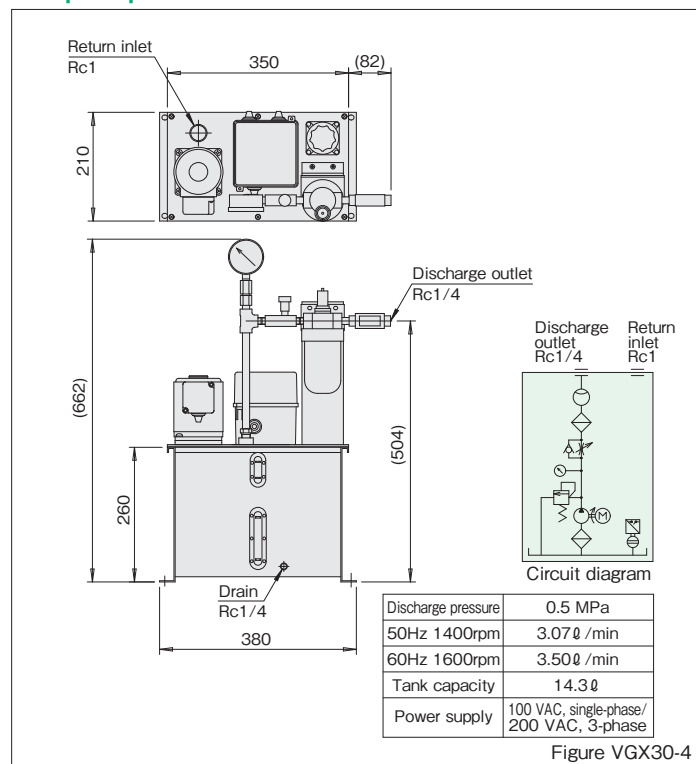
Maximum feed capability chart (Drive method: S.C.T.)



Timing chart



Oil pump



Dimensions

[Unit:mm]

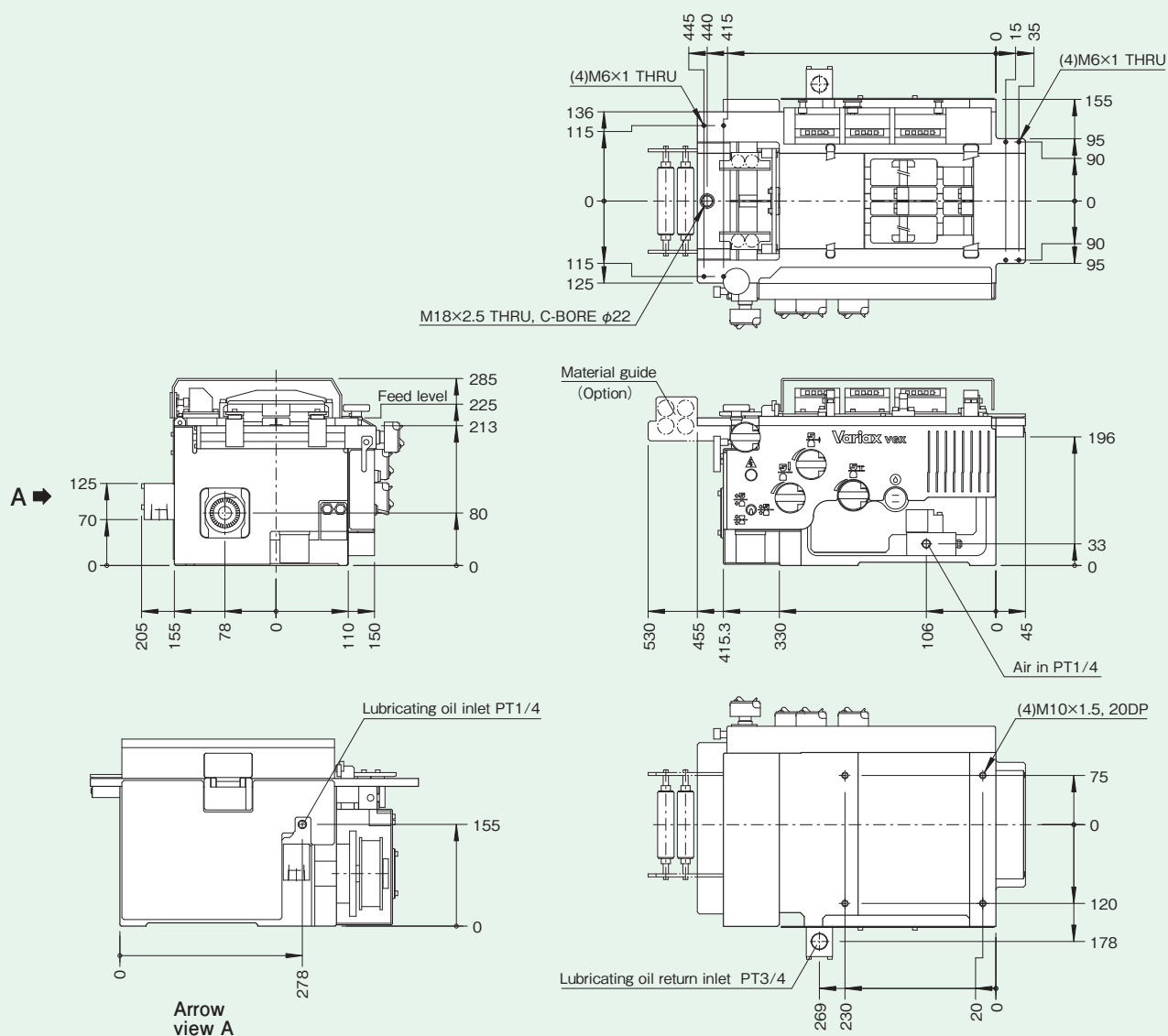


Figure VGX60-1

Specification table

Characteristic	Data
Feed length	0 to 60 [mm]
Material thickness	0.1 to 2*1 [mm]
Gripping force	1,700 [N]
Material width	8 to 100 [mm]
Maximum number of strokes	1500 [min^{-1}]
Maximum feed speed	50 [m/min]
Minimum Increments for Feed Pitch	0.005 [mm]
Feed Angle	165 [deg]
Repeatability	$\pm 0.025^{*2}$ [mm]
Pilot Release	Approx. 49 [deg]
Input Shaft Drive Ratio	2:1*3 [rpm:s]

*1 If your material is over 1 mm thick, please contact our Sales Department.

*2 The feed precision depends on the operating conditions. The values given here are for reference purposes only.

*3 VGX60 feeds one time for every two rotations of the input shaft. Therefore, set the drive speed ratio of the input shaft to 2:1.

Characteristic	Data
Operating air pressure	490 to 690 [kPa]
Lubricating oil pressure	290 to 490 [kPa]
Lude flow supply	0.4 [ℓ/min]
Operating power supply	100 VAC single phase [V]
Product weight	95 [kg]
Recommended lubrication oil	Shell Omala S2 G 68
Lubrication system	Forced lubrication
Housing color	5Y7/1
Operation panel color	2.5Y9/0.2

1[N·m] \approx 0.102[kgf·m]

Maximum feed capability chart (Drive method: S.C.T.)

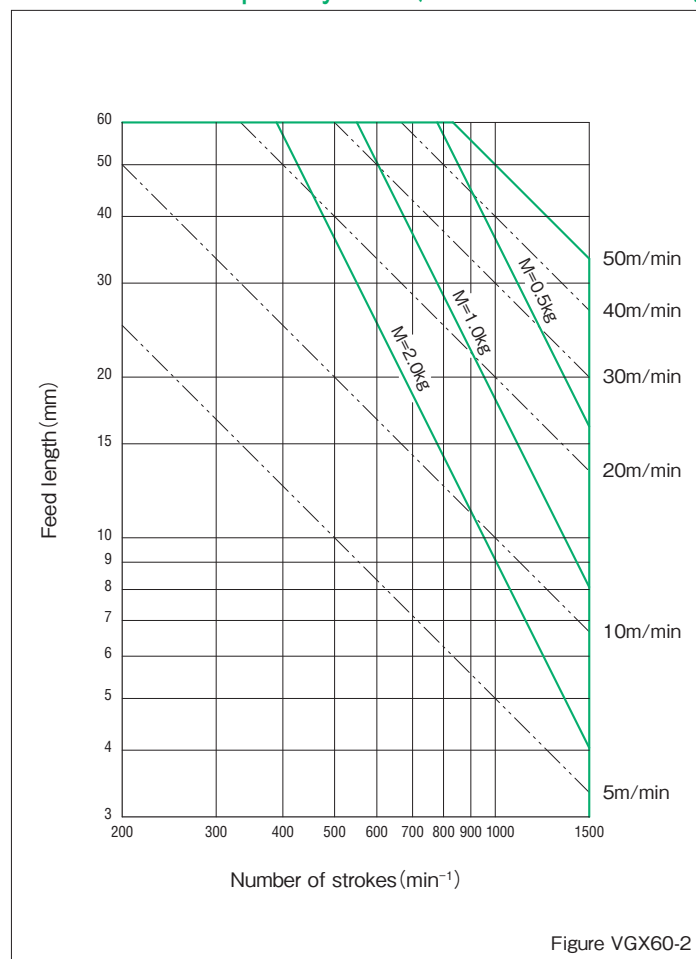


Figure VGX60-2

Timing chart

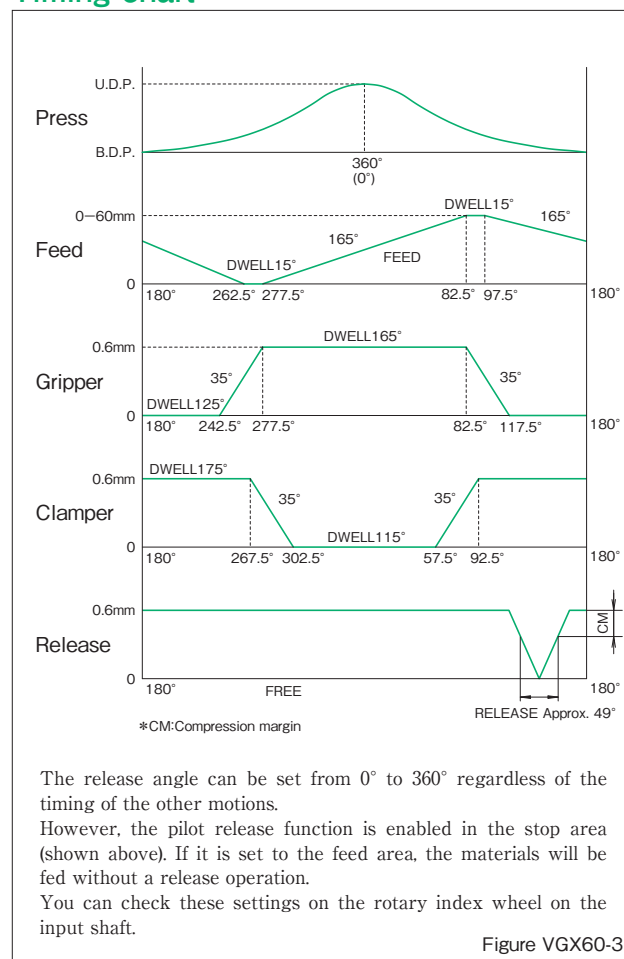


Figure VGX60-3

Oil pump

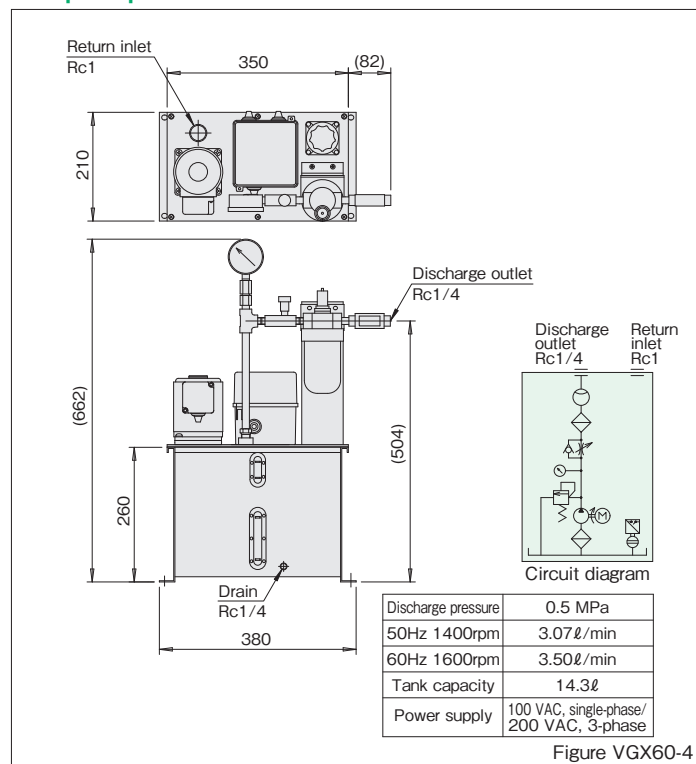


Figure VGX60-4

Dimensions

[Unit:mm]

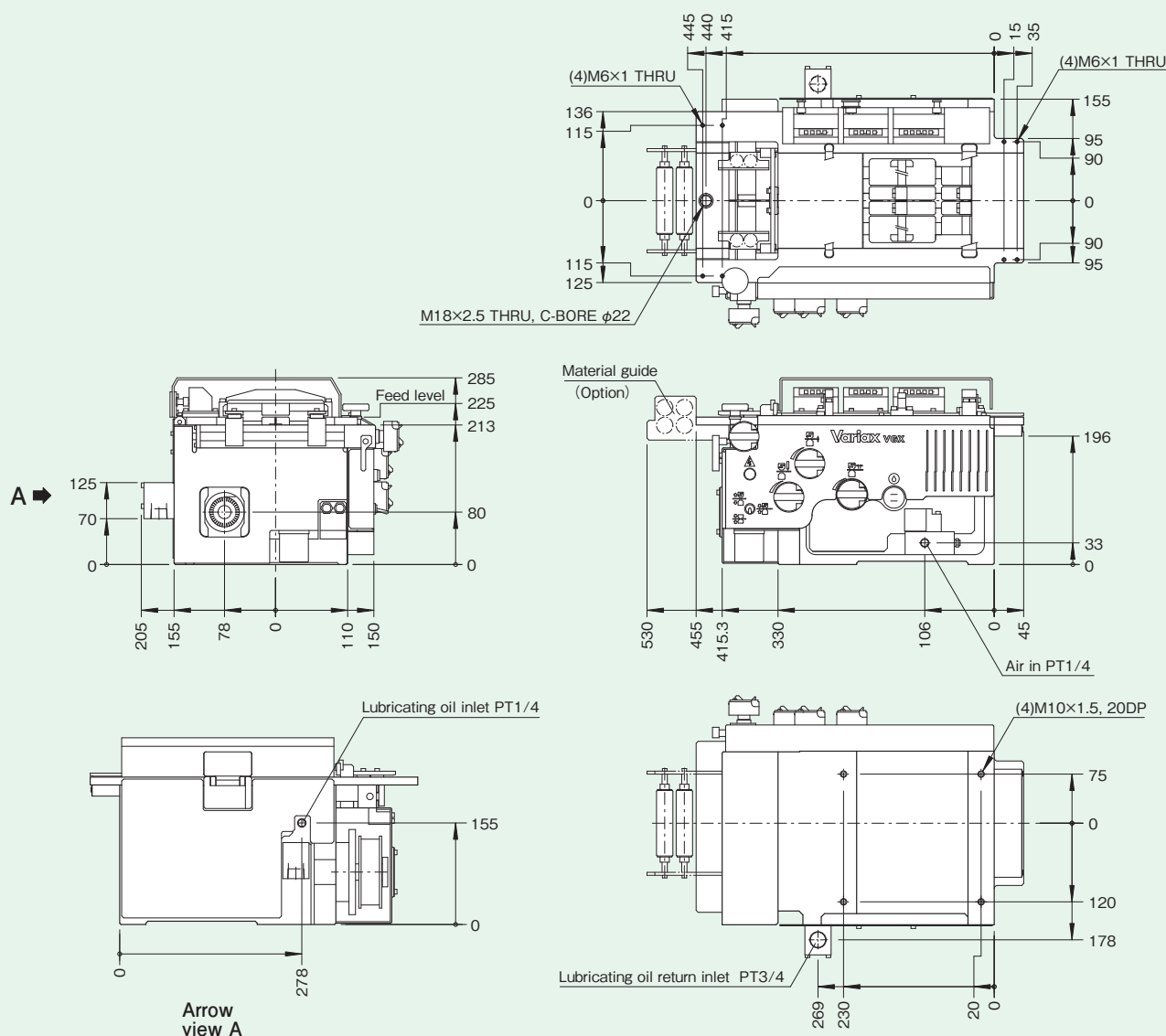


Figure VGX100-1

Specification table

Characteristic	Data
Feed length	0 to 100 [mm]
Material thickness	0.1 to 2*1 [mm]
Gripping force	1,700 [N]
Material width	8 to 100 [mm]
Maximum number of strokes	1000 [min^{-1}]
Maximum feed speed	50 [m/min]
Minimum Increments for Feed Pitch	0.005 [mm]
Feed Angle	165 [deg]
Repeatability	$\pm 0.025^{*2}$ [mm]
Pilot Release	Approx. 49 [deg]
Input Shaft Drive Ratio	2:1*3 [rpm:s]

*1 If your material is over 1 mm thick, please contact our Sales Department.

*2 The feed precision depends on the operating conditions. The values given here are for reference purposes only.

*3 VGX100 feeds one time for every two rotations of the input shaft. Therefore, set the drive speed ratio of the input shaft to 2:1.

Characteristic	Data
Operating air pressure	490 to 690 [kPa]
Lubricating oil pressure	290 to 490 [kPa]
Lude flow supply	0.4 [l/min]
Operating power supply	100 VAC single phase [V]
Product weight	95 [kg]
Recommended lubrication oil	Shell Omala S2 G 68
Lubrication system	Forced lubrication
Housing color	5Y7/1
Operation panel color	2.5Y9/0.2

1[N·m] \approx 0.102[kgf·m]

Maximum feed capability chart (Drive method: S.C.T.)

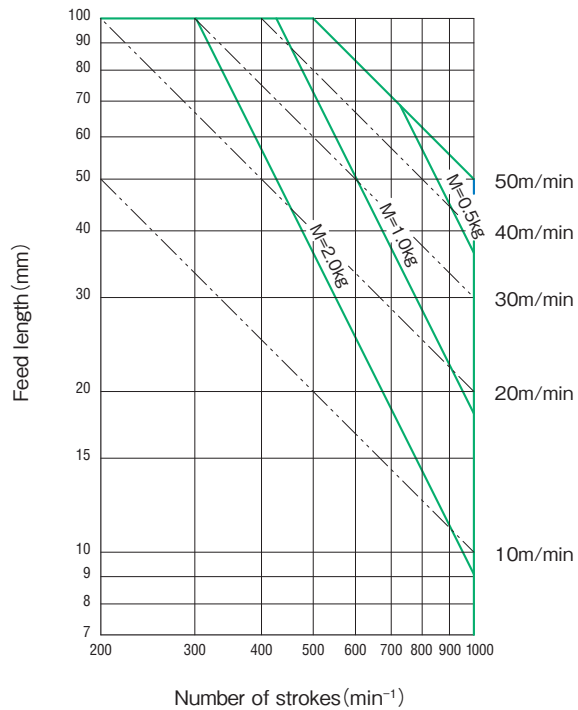
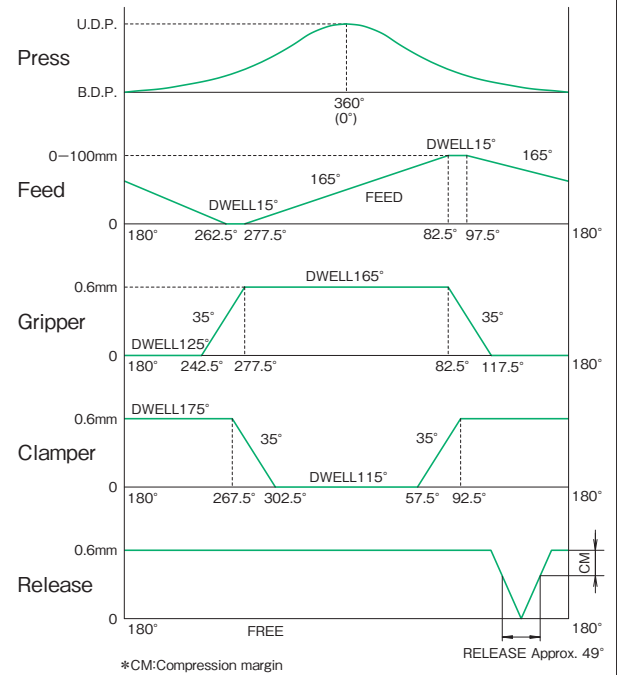


Figure VGX100-2

Timing chart



The release angle can be set from 0° to 360° regardless of the timing of the other motions.

However, the pilot release function is enabled in the stop area (shown above). If it is set to the feed area, the materials will be fed without a release operation.

You can check these settings on the rotary index wheel on the input shaft.

Figure VGX100-3

Oil pump

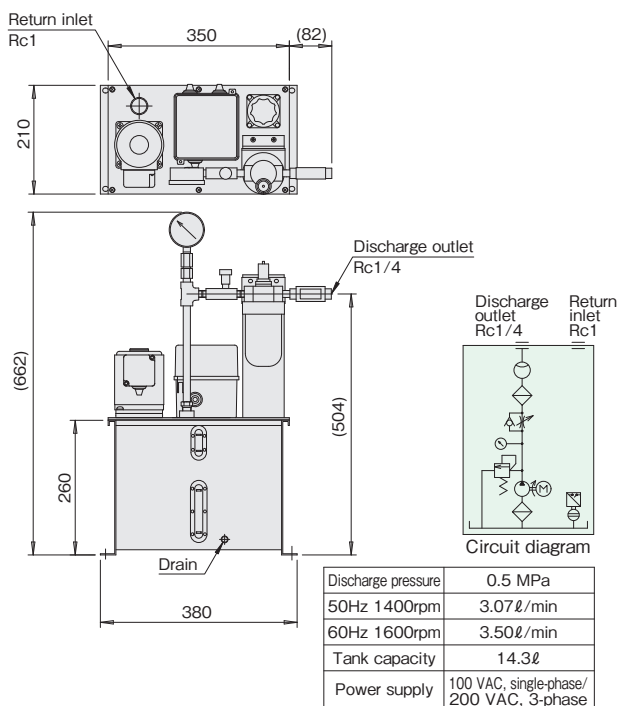


Figure VGX100-4

Dimensions

[Unit:mm]

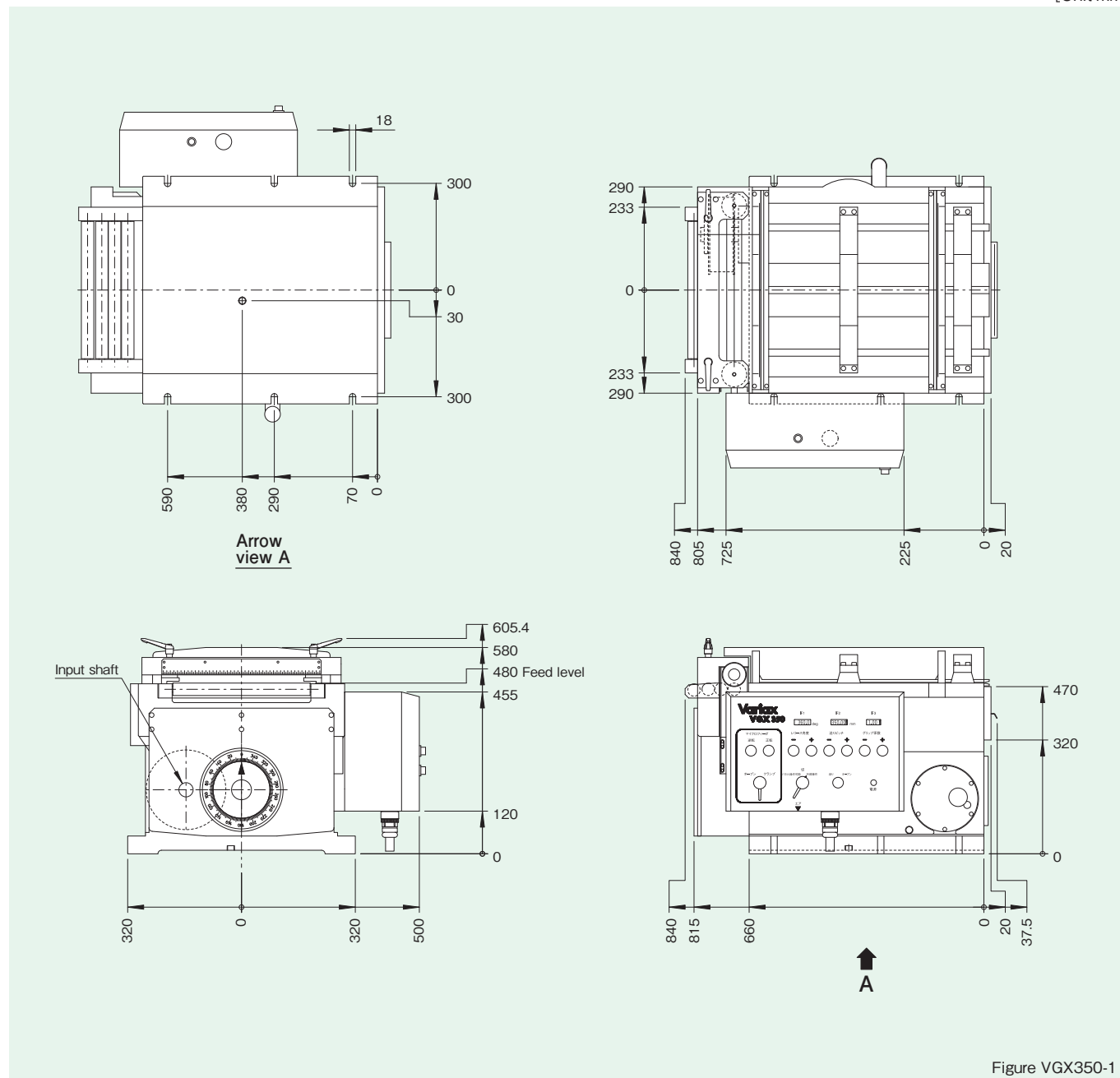


Figure VGX350-1

Specification table

Characteristic	Data
Feed length	50 to 350 [mm]
Material thickness	0.1 to 1*1 [mm]
Gripping force	5,000 [N]
Material width	70 to 420 [mm]
Maximum number of strokes	300 [min ⁻¹]
Maximum feed speed	90 [m/min]
Minimum Increments for Feed Pitch	0.01 [mm]
Feed Angle	165 [deg]
Repeatability	±0.08*2 [mm]
Pilot Release	Approx. 46 [deg]
Input Shaft Drive Ratio	2:1*3 [rpm:s]

*1 If your material is over 1 mm thick, please contact our Sales Department.

*2 The feed precision depends on the operating conditions. The values given here are for reference purposes only.

*3 VGX350 feeds one time for every two rotations of the input shaft. Therefore, set the drive speed ratio of the input shaft to 2:1.

Characteristic	Data
Operating air pressure	490 to 690 [kPa]
Lubricating oil pressure	290 to 490 [kPa]
Lude flow supply	1.5 to 2.2 [ℓ/min]
Operating power supply	100 VAC single phase [V]
Product weight	750 [kg]
Recommended lubrication oil	Shell Omala S2 G 68
Lubrication system	Forced lubrication
Housing color	5Y7/1
Operation panel color	2.5Y9/0.2

1[N·m] ≒ 0.102[kgf·m]

Maximum feed capability chart (Drive method: S.C.T.)

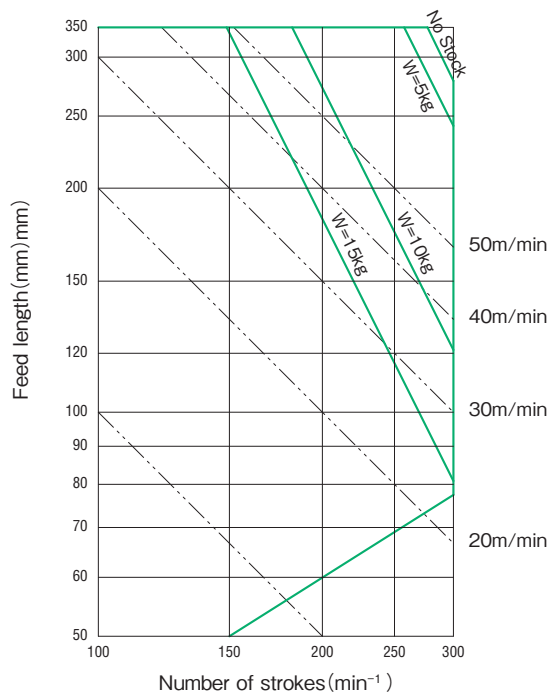
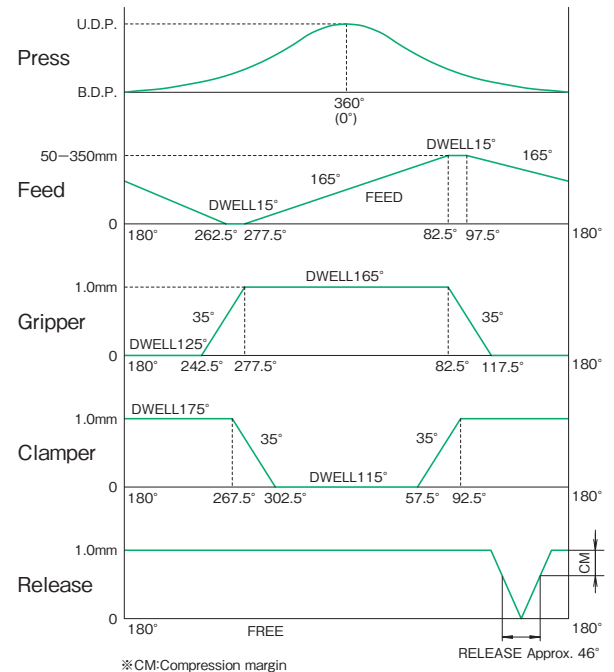


Figure VGX350-2

Timing chart



The release angle can be set from 0° to 360° regardless of the timing of the other motions.

However, the pilot release function is enabled in the stop area (shown above). If it is set to the feed area, the materials will be fed without a release operation.

You can check these settings on the rotary index wheel on the input shaft.

Figure VGX350-3

Oil pump

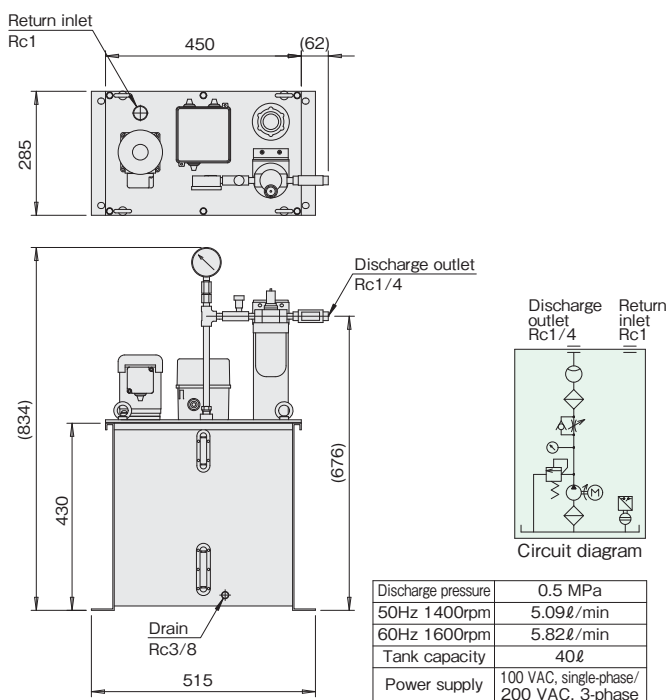
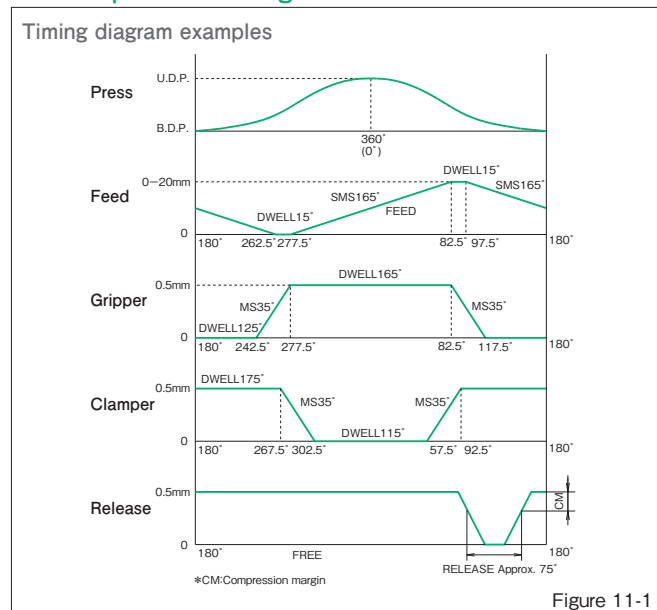


Figure VGX350-4



Variax operation timing



In the Variax, a total of four cams (the roller gear cam for feeding, the plate cams for gripping, the clamper, and for release) perform feed operations according to the timing shown in the example timing diagram above.

There is a DWELL area at both ends of the feed and the return areas of the feed cam. When in this DWELL area, the material can be transferred by the gripper and clamper.

The cam for release can be set to operate in any area, regardless of the timing of other cams.

However, if it is set to operate in the feed area of the feed cam, the Variax will operate without any other release occurring.

You can check these settings on the rotary index wheel on the input shaft. (With the VGX series, you can check these timings directly on the counter.)

Feed Angle

The standard feed angle of Variax is set to provide the best balance between feeding and returning in the oscillating motion of the roller and gripper, which makes it well suited for high-speed feeding. Be especially careful when using a press that has a link motion with the Variax or when using a die that has a long pilot pin.

Release angle

When using a die with a pilot pin it is necessary to match the pilot timing with the Variax's release timing.

The release timing can be adjusted arbitrarily up to 360° using the release timing adjustment device on each model.

No-release feeding is also possible by setting the release timing to occur within the feed angle.

The release angles shown in the characteristics table for each model are guidelines for a standard compression margin.

Please note that the actual release angle will change, depending on the compression margin. (See the "Compression Margin" section.)

In a production process in which the standard feed angle and release angle may not offer the best feed operation, the feed angle and release angle of the Variax can be changed to custom specifications for you. However, to convert a Variax to custom specifications, we will need to disassemble a standard Variax. Therefore, if you desire custom specifications, please contact us before placing your order.

Compression margin (C.M.)

Generally, when feeding material with a feeder, the material is gripped between the upper and lower rollers, or grippers, to be fed. When gripping material, if the dimension between the upper and lower rollers (or grippers) is set smaller than the thickness dimension of the material to be feed, the material may become warped or curved, due to the gripping force between the rollers or grippers. Therefore, the distance between these rollers or grippers must be adjusted appropriately.

The compression margin (CM) is a numerical value of how small the distance between the rollers or grippers can be, with respect to the material thickness being fed. It is calculated using the formula: "compression margin (CM) = plate thickness (t) - gap (T)".

By using this method of setting the compression margin, no matter how much the gripping force is used, the material will not be gripped with a higher force than the CM.

If the CM is within the longitudinal elastic modulus range of the material, it will not be distorted, and sufficient grip can be applied to enable high-speed feeding.

The compression margin setting affects the pilot release angle during press work.

The release angle is shown in the specifications table of each model. However, these are only guidelines for the standard compression margin. The actual release angle may change, depending on the compression margin used.

(The larger the compression margin, the smaller the pilot release angle.

See the figure below.)

The table below shows the standard compression margin for each model and the guidelines for the thickness tolerance of material that can be fed using these margins. However, the CM can be adjusted.

If you are using a material that is not covered by this table, please contact our sales staff before using it in your Variax.

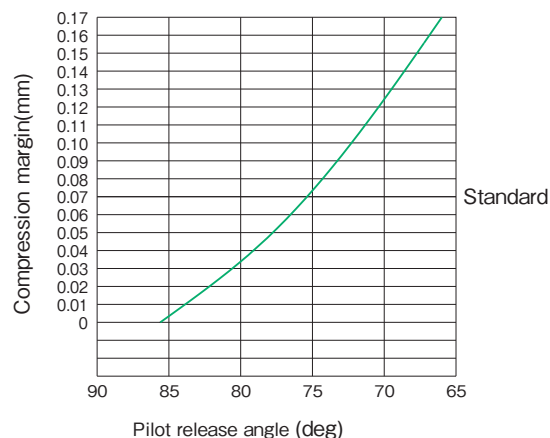
Standard compression margin

Table 11-1

VGX030/060/100	
Compression margin(mm)	0.1
Material tolerances(mm)	+0.05 -0.05

*Please contact us about the compression margin of the VGX350.

Sample pilot release diagram



Standard

Table 11-2

*The pilot release diagram for each model will be shown in the specifications we will send you separately.

How to read the feeding capacity diagram.

The feeding capacity of the Variax is set according to the individual feeding device, and the speed and mass of the material to be fed. In the case of the press layout shown below, the material mass M that is intermittently transferred is calculated as M (kg) = material thickness (m) \times material width (m) \times length l (m) \times density (kg/m³). Find the maximum press speed by locating the material mass and feed length on the maximum feed capacity diagram for each model. The press rotation speed shown does not include friction between the material and the guides, or any other loads such as resistance caused by flapping material. As a general guide, set the production speed to about 80% of this speed.

(See Figure 12-2)

If the rotation speed shown is not possible in actual operation due to various conditions such as friction between the rollers and the material, friction between the material and the guides, the actual load, or to resistance due to flapping material, reduce the rotation speed.

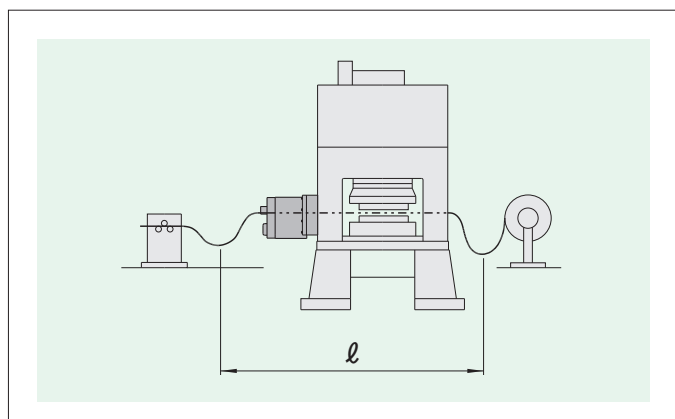


Figure 12-1

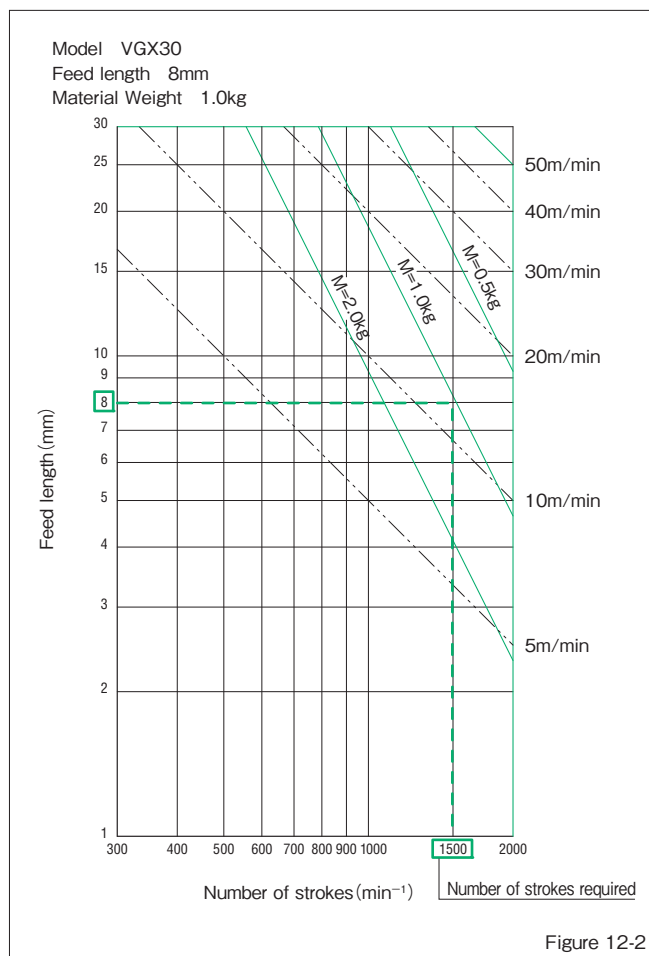


Figure 12-2

Lubrication

Lubrication of precision machinery plays an important role in achieving full functionality.

In other words, it reduces the friction of sliding and rolling parts, removes heat caused by friction, and prevents corrosion.

As a precision machine, the Variax needs to be fully lubricated to obtain the designed product life.

Variax adopts the optimum lubrication system for each model, and the VGX series uses an external lubrication system. However, if the specifications match the press's lubrication system, it is flexible enough that it can share its lubrication system with the press.

Lubricant management is an important daily inspection item.

Here are some points to keep in mind when managing lubricants.

(For details, please check the instruction manual.)

(1) Check the oil supply

The oil level in the oil bath and lubricating oil tank should be checked once a day, at the beginning of work or before operating the Variax.

Also, in the case of an external lubrication system, make sure that the oil supply flow rate is appropriate.

(2) Replacement of lubricating oil

Lubricating oil deteriorates when it is used for a long time. This decreases its lubricating performance significantly. Therefore, it is

necessary to replace the oil after a certain amount of operating time.

Change the oil after the first 1000 hours of operation, or after the first six months.

Then, change the oil once a year or every 3000 hours of operation.

(3) Recommended oil

From our long experience, Sankyo has selected the best lubricating oil for each feeder.

These lubricants are high-quality mineral oils with additives that improve lubrication performance.

The recommended oil varies, depending on the model, so refer to the instruction manual for each feeder.

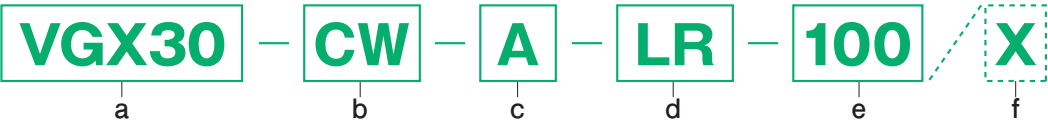
Recommended lubrication oil

Table 12-1

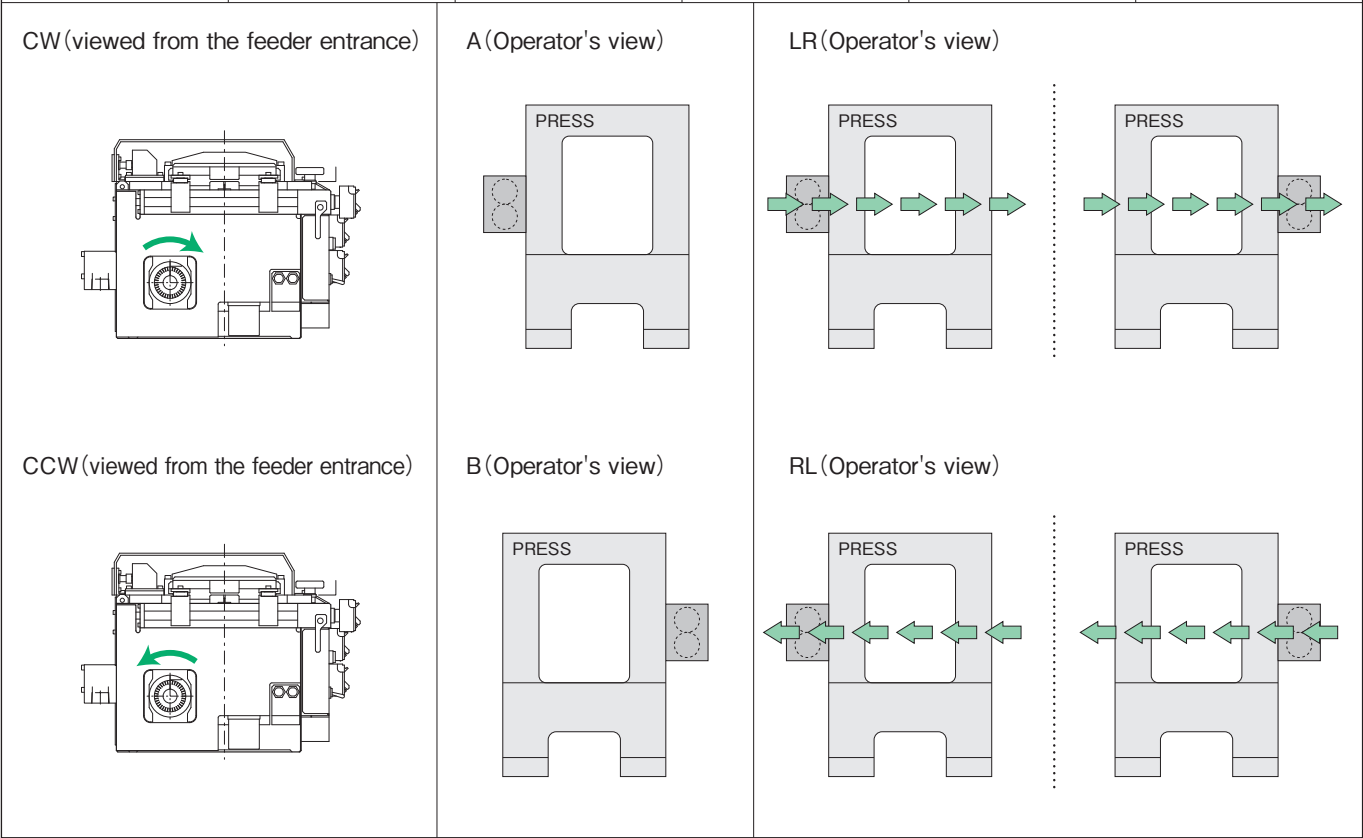
Manufacturer	Brand name
ENEOS	Bonnok TS68
Exxon Mobile	Mobilgear 600 XP 68
Idemitsu	Daphne Super Gear oil 68
Cosmo	Cosmo Gear SE68
Shell	Shell Omala S2 G 68

Model code

Feed model code

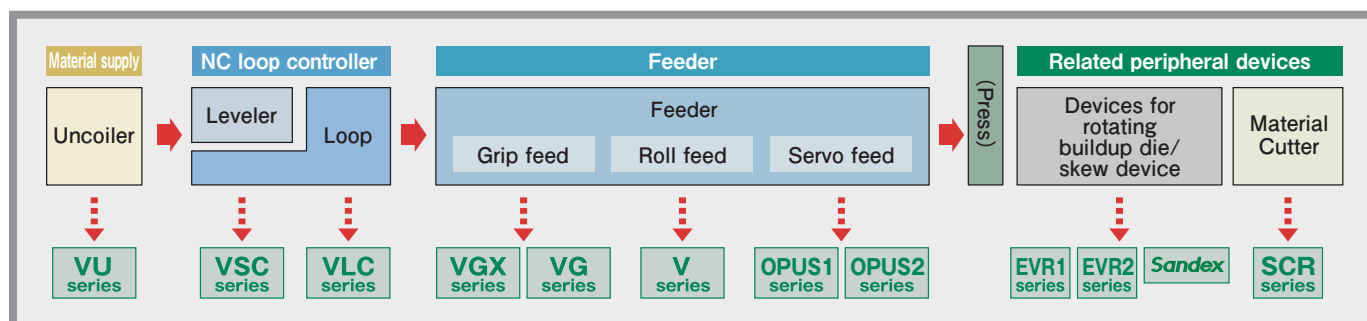
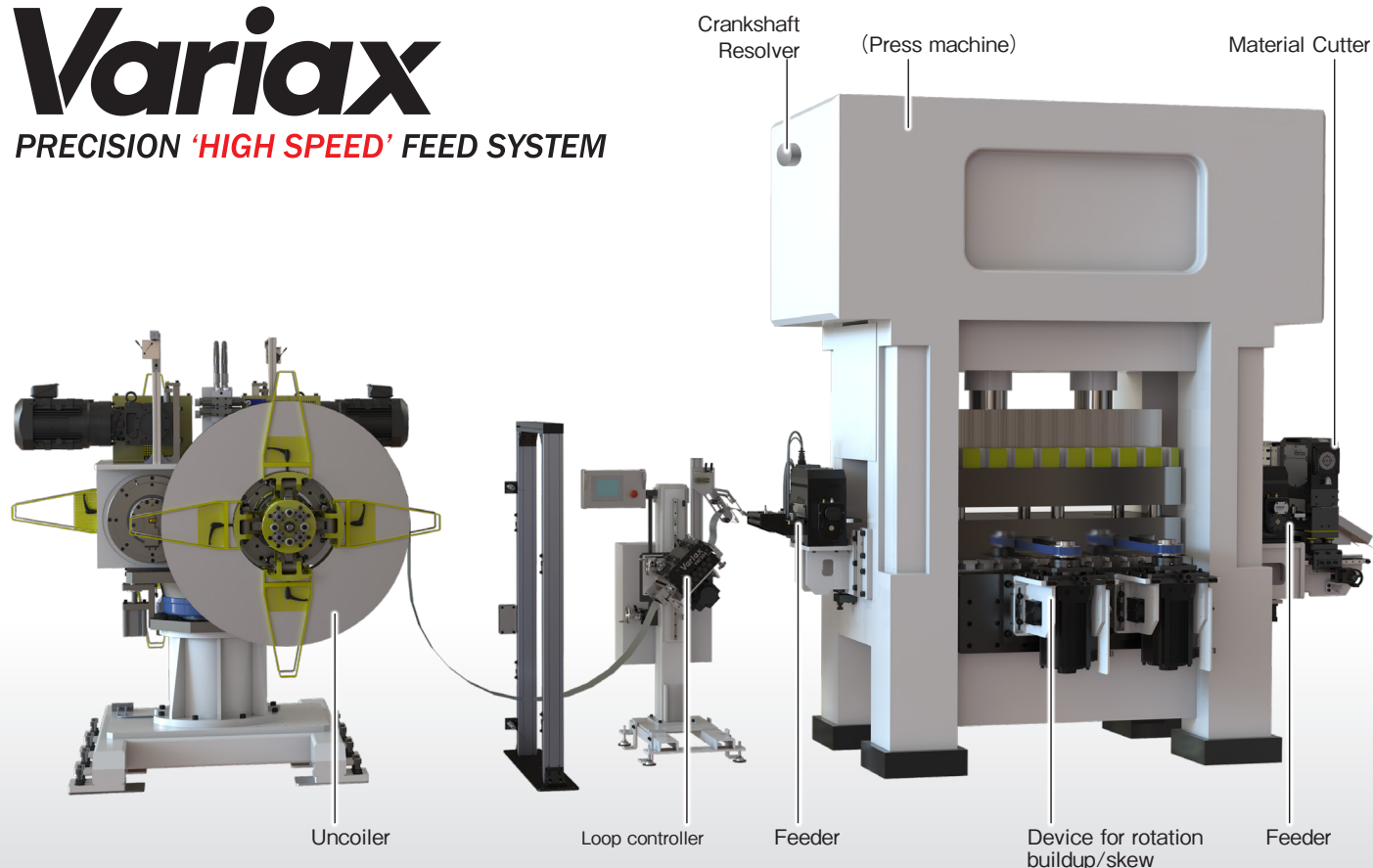


a Series and size	b Rotation direction	c Mounting position	d Feed direction	e Input power supply	f Custom order
Example VGX30 Maximum feed length: 30 mm	Example CW Input shaft rotation: clockwise	Example A On the left when viewed from the operator side	Example LR Feed is from left to right when viewed from the operator side	Example 100 Input power supply AC100V	Example X Custom order
The maximum feed length is as follows. VGX30 30mm VGX60 60mm VGX100 100mm VGX350 350mm	Clockwise CW or counterclockwise CCW input shaft rotation direction are both available.	The mounting direction can be A : left side, or B : right side.	The feed direction can be specified: LR , feed from left to right, or RL , from right to left.	Select 100 :100VAC or 115 :115VAC input power.	Check the Custom order box below only if there are special specifications. <input type="checkbox"/> Standard <input checked="" type="checkbox"/> Custom order



Variax

PRECISION 'HIGH SPEED' FEED SYSTEM



VSC/VLC series

A loop controller that can create stable, well-formed loops, even at high speeds, to speed up press lines.



VG series

A cam type gripper feeder that achieves high productivity with a variation that can handle any type of operation and a feed mechanism that does not mar materials.



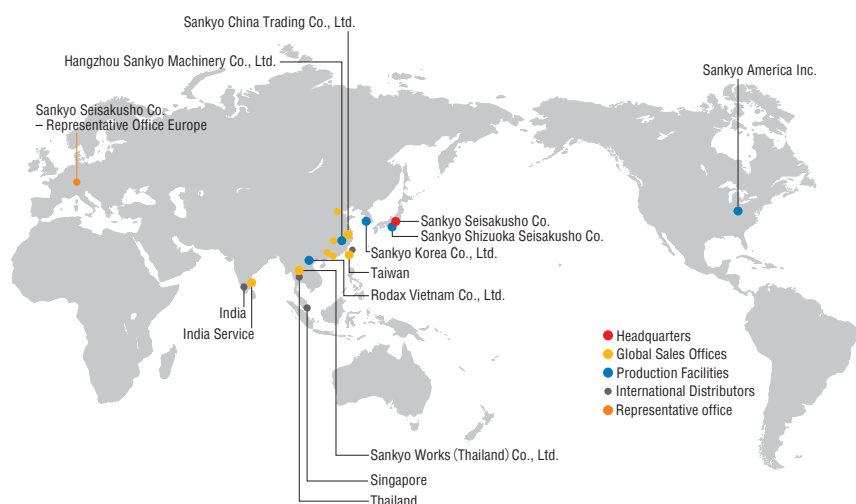
V series

A proven cam type roller feeder that has been used for many years at many press work sites, enables faster and more accurate material feeding.



OPUS1 series

High-performance servo feeder for upper and lower roll drive with IoT compatibility.



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