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| Subject: Screw Feeder Overview | Product: Motion Products | Doc#: AO.MCD.06.M53 |
| Title: Screw Feeder | | |

Screw Feeder

Application Overview

Screw feeders are used in various industries for the metering of material into a production process. Screw feeder design closely resembles that of a screw conveyor, but unlike a screw conveyor, a screw feeder is required to be very precise and accurate. The screw in a screw feeder is completely filled with material, compared to a screw conveyor which is typically 40-50% filled. That is part of the reason the material is accurately discharged when the feeder screw is rotating at a controlled rate.

Application Challenges:

- **Fast response** – Capable of accurately regulating material feed
- **Load detection** – Capable of detecting an overload or no material in the screw situation
- **Speed range** – Be able to provide the required amount of torque throughout the speed range

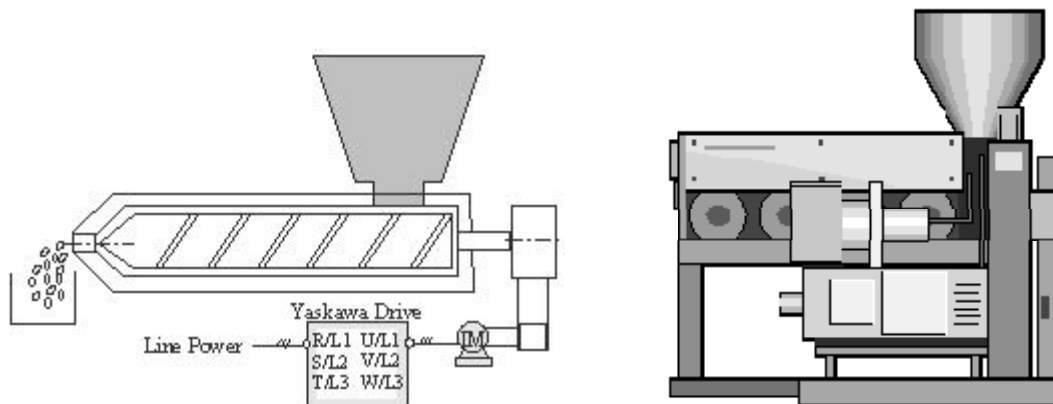
Yaskawa Products:

| Product | Feature | Benefit |
|----------------------------|---|---|
| MP2600iec | Machine control capabilities in single-axis controller | Perform auxiliary functions to help centralize process and integrate machine |
| | Easy-to-use IEC61131-3 software programming environment | Minimize development time and enhance user flexibility |
| | Servo position loop at 125 microsec update rate | Maximize servo control for accurate speed regulation |
| | Wide range of servo monitors | Monitor torque output to aid in load detection |
| Sigma-5 Servomotors | 1.6kHz speed loop frequency response | Enhanced control for improved material regulation |
| | Speed range of 5000:1 | Improved control at low speed to properly drive screw across wide speed range |
| | Variety of control methods with the SGD-V amplifier | Integrate with a range of controllers for improved application flexibility |

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Application Details:

Screw feeders can generally be classified in one of two categories: volumetric or gravimetric. Both these types of feeders are required to be precise in the amount of material that is fed into the process. A volumetric feeder accomplishes its accurate feed rate by maintaining a commanded speed, which through calibration of the feeder would deliver a specific feed rate of material into the process. The screw speed can be set linearly through the amplifier's analog inputs or preset with digital inputs.



The high-performance of the Sigma-5 servomotors makes these motors excellent options for driving the screw feeder. A wide speed range coupled with a large control bandwidth allows the servomotors to accurately and precisely control the speed of the screw in order to feed the precise amount of material for the process. Incorporating a Yaskawa motion controller can help centralize the motion control in order to maximize machine performance. The MP2600iec comes equipped with a vast array of servo monitors that allows the user to write routines for specialized functions such as load detection. In addition, the easy-to-use MotionWorks IEC programming environment allows the user to easily integrate a wide range of machine functions into one controller.