NGR®
RECYCLING MACHINES

RECYCLING MACHINE

# A:GRAN

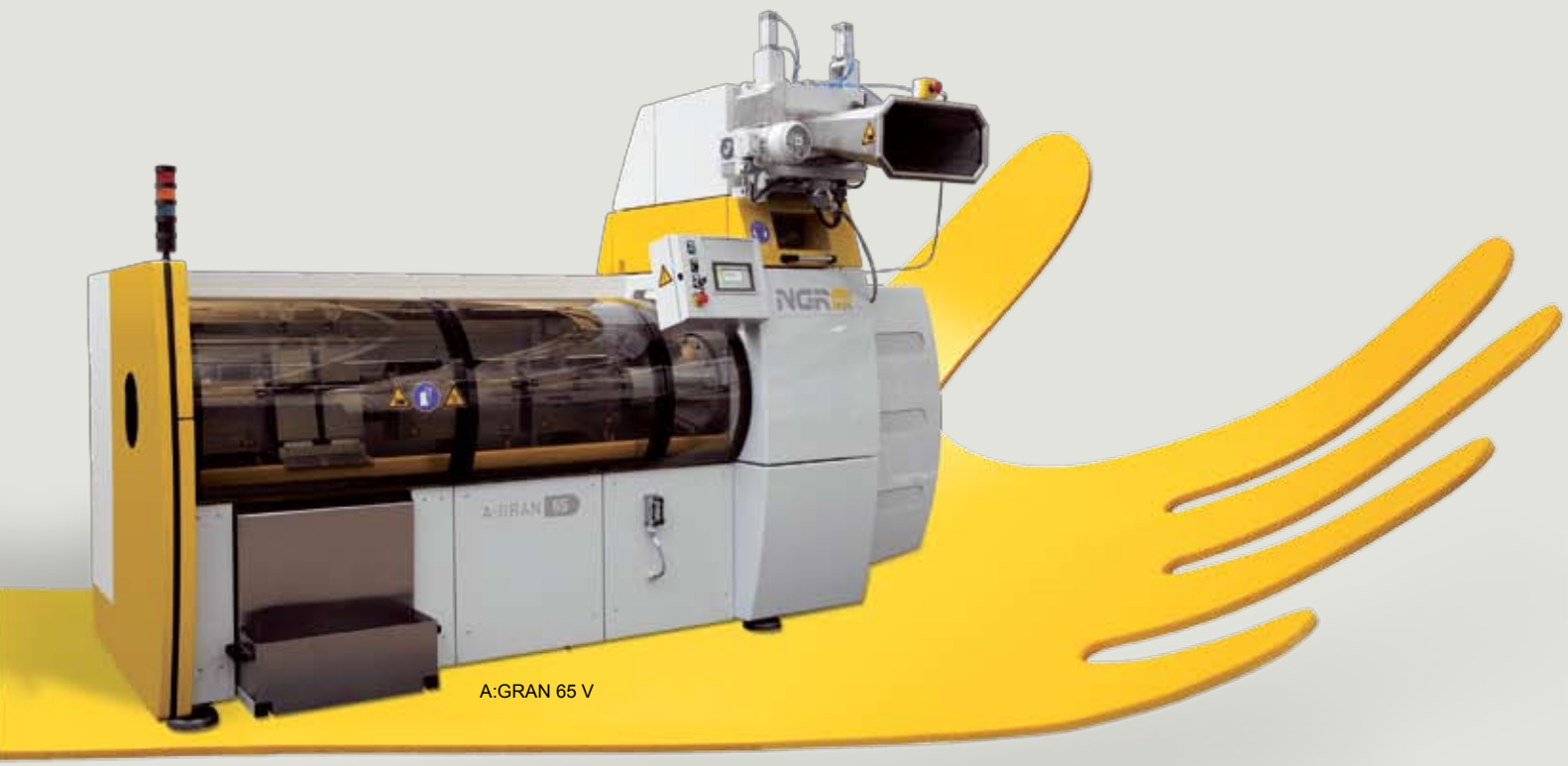
65

**IS DESIGNED FOR …**

…all polymers

…smaller forms of scrap

…pelletizer output of 44 – 220 lbs/hr



A:GRAN 65 V

12 | 08, US

# PATENTED “ONE-STEP” TECHNOLOGY*

## 3 steps combined into 1 machine

The key to the A:GRAN One-Step machine is the combination of the **“shredder-feeder”** with the **extruder**. This design turns your scrap into valuable pellets easily and efficiently:

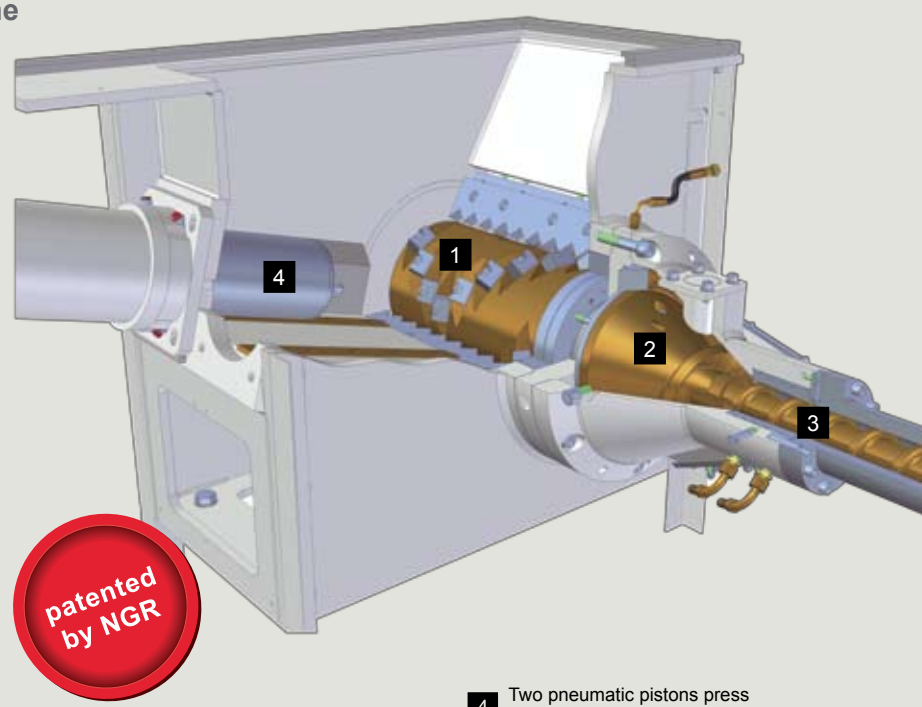
1 SHREDDER-FEEDER: Heavy duty shredder section cuts the plastic scrap, and feeds directly into extruder.

2 EXTRUDER: The extruder melts the material and, if required, venting (degassing) is done.

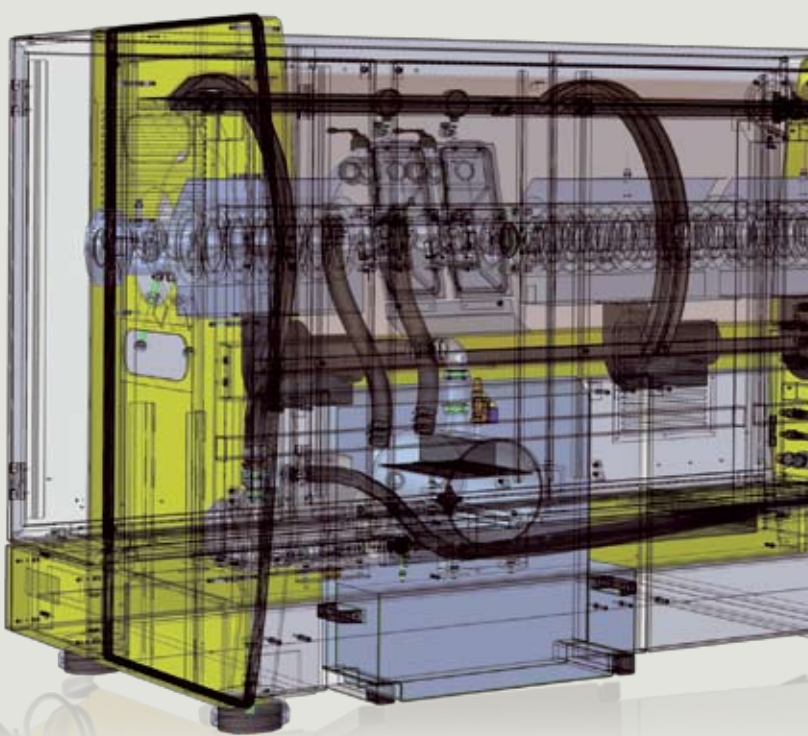
3 PELLETIZER: The material is filtered and pelletized into easy-to-use plastic pellets.

This all occurs without the material ever leaving the machine, which is why the process is known as **“NGR One-Step technology”**. One step processing, one-step responsibility.

In the case of the A:GRAN, the invention has been so adapted that all three of the main components – the shredder, the feeder screw and the extruder are mounted on a single shaft with a single drive/e-motor.




4 Two pneumatic pistons press the material against the cutter.



* S:GRAN series

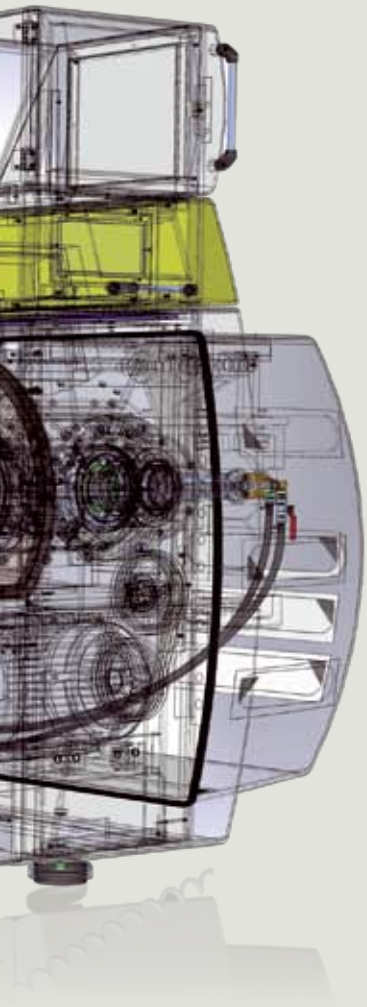
# SUITABLE FOR A WIDE RANGE OF APPLICATIONS

## Polymers ...

Virtually all thermoplastic polymers, including PE, PP, PA, PS, PC, PET, ABS, EVA, PPS, biopolymers and other technical plastics, can be efficiently and cleanly recycled into pellets with minimal property loss. The A:GRAN control system provides complete recipe control and simplifies machine operation to make it easy for your operators.

## ... in any form

The A:GRAN has been designed for the inline processing of film edge strips, loose scrap and roll scrap and is equipped with a single e-drive for the shredder/feeder/extruder. The efficient shredder and fine control for differing quantities of material greatly expand the range of machine applications. Control takes place by means of two pneumatic pistons, which press the material onto the shredder to control the amount of material fed to the extruder.



PP netting

Nonwoven fabric

Start-up lumps/purgings

Heavily printed LDPE film

Printed LPDE film

PP synthetic grass

- All types of film waste (on rolls, slabbed or bundled)
- Loose bags and cutouts
- Start-up lumps and purgings
- Pipes & Profiles
- Injection and blow molded parts
- Nonwovens and woven fabrics
- Yarns and ropes

On average, the industrial manufacture of plastic products results in 2 - 20 % scrap material. This can include start-up scrap, which results until the required product specifications (such as thickness, color, shape and properties) are being attained, and change-over waste resulting from production changes. There is also sometimes normal process waste, such as film edge/bleed trims, sprues, or stamping waste. This scrap often represents a large percentage of potential profit margin and NGR S:Gran systems can quickly, easily and cost-effectively recover this profit.

# QUALITY

## Reliability through robust design

The A:GRAN has an especially compact and stable design, which in its simplicity saves both space and drive power. The A:GRAN is characterized by long service life even at full performance and with the processing of problematic materials such as PA fibers.

In addition, low shredder shaft speeds give excellent cutting performance combined with long blade life.

Stationary knife

## Designed and built for long-term profitability

Robust design, high-grade materials and top quality manufacturing in combination with the finest possible controls and proven electronics, guarantee a long service life that extends far beyond the short payback period. It is then that NGR machines pay for themselves over and over again, as hundreds of operators on every continent can confirm.

## Simplicity through Automation

The A:GRAN machine can be fully integrated into the film production process. This ensures safe and cost-effective inline operation.

The A:GRAN is designed for continuous feeding in inline operation, but is also able to react automatically to any changes in material quantity and can therefore produce pellets of uniform high quality. To achieve this result, the pneumatic pistons on the cutter and the extruder and pelletizer speeds are controlled automatically.

## Simple maintenance and long operating periods

A high degree of process stability minimizes the influence of the operating personnel on pellet quality. NGR designed the A:GRAN with simple access to wear parts to reduce scheduled down-time to a minimum.

Glass inspection window/
maintenance opening on the feeder


Easy-to-use Operator controls

# MACHINE OPERATING PRINCIPLES

## Simultaneous processing of material in diverse forms

The size and quantity of the incoming scrap material is only restricted by the hopper opening and not the process. Therefore, several differing material feeding systems can be employed simultaneously.

## Reduced Labor Costs

The NGR recycling process is very simple and requires only a sufficient inflow of material. In order to operate, NGR machines normally need just one person to handle this feeding task. This often creates significant labor cost savings and eliminates messy multiple handling of the same material.

## Problem-free restarts after emergency stops

Following sudden plant stops (e.g. power loss, emergency stops), the machine can be immediately restarted without any problem with filled hopper and extruder screw.

1 Solids such as start-up lumps and loose waste can be fed through the hopper opening. The A:GRAN funnel cross-section also permits the feeding of bulky items up to the size of the opening. As an option, this material feed flap can be fitted with a

2 **conveyor belt**, in order to allow continuous feeding. A detector provides a warning of metal items in the scrap.

3 The **roll feeder** allows the processing of film in roll form.

4 The **air separator** allows the continuous recycling of film edge and/or bleed trims.

1 Start-up rejects are quickly and efficiently recovered.

4 Air separator


6

Pelletzing systems

# FAST PAYBACK TIME

## High-quality pellets means high-quality end products

The NGR design principle produces pellets with a minimum of property loss. This allows you to achieve the highest value end-use for your scrap and often allows you to use your repelletized scrap at full value to virgin resin in many products. The low speed drum shreds the material, which is then fed directly into the extruder without losing the frictional heat generated during the cutting process. The gently melted plastic produces high material quality with minimal loss of physical characteristics.

In addition to high quality, the uniform pellet size allows it to be mixed homogenously with original material. This gives you the highest value from your recovered scrap and ensures the quality and integrity of your end-products.

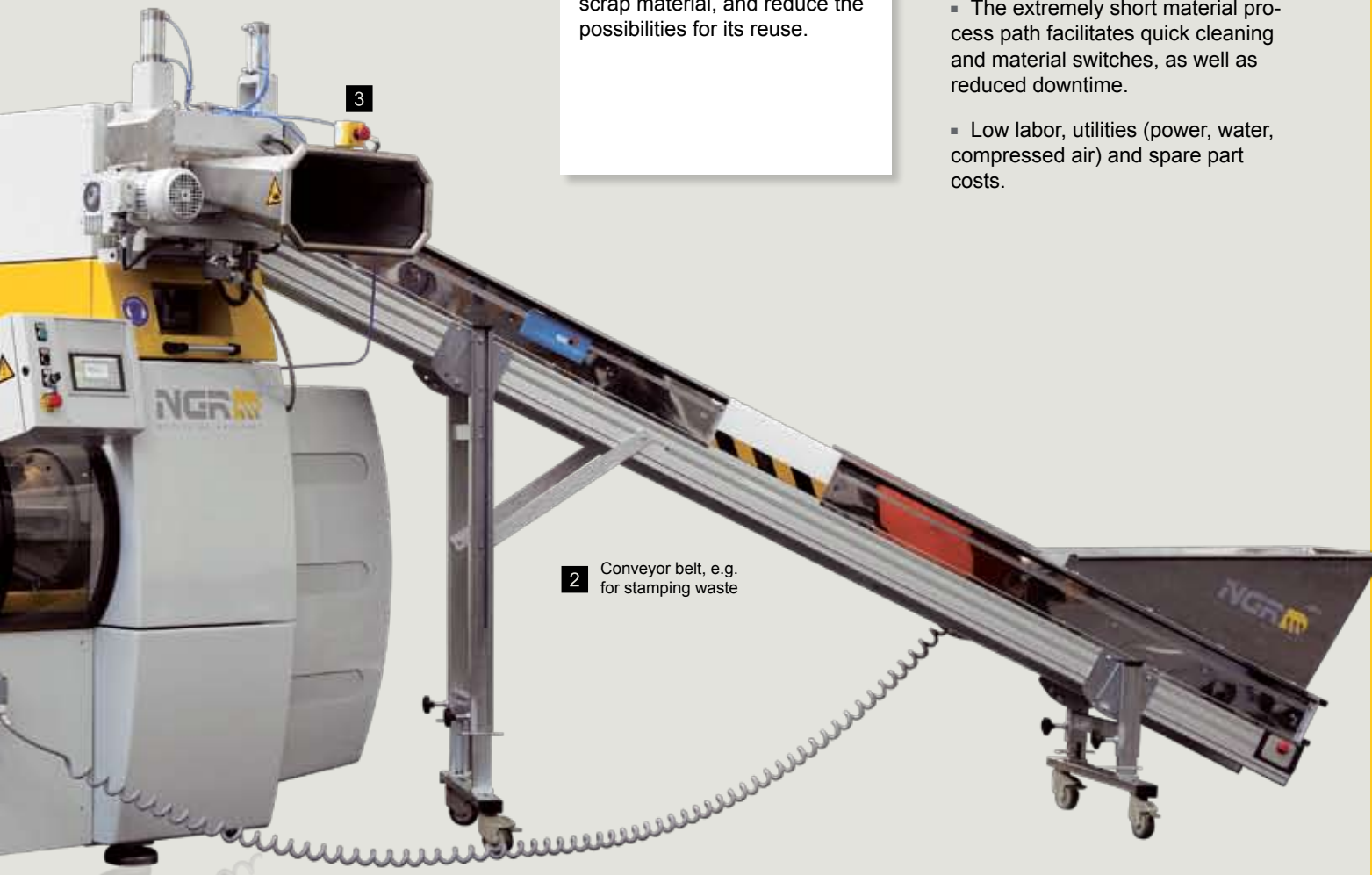
"Old technology" recycling systems can have a major negative effect on polymer quality. Undesirable deviations such as losses in viscosity or discoloring can reduce the value of the scrap material, and reduce the possibilities for its reuse.

## Payback in 6 - 12 months!

## Low labor, energy and maintenance costs

Due to their excellent output rates, low operating costs, and high uptime and process stability NGR One-Step machines typically offer extremely short payback periods.

- One-step design eliminates separate size reduction and interim storage equipment, greatly reducing the required floor space for a plant repelletizing operation.
- **NGR's one-step technology provide energy cost savings of up to 40 %*.**
The shredded plastic is immediately fed to the extrusion process and is therefore already heated above ambient temperatures. This reduces the energy needed for material melting.
- The investment, operating and maintenance costs for a pre-shredding system are no longer required.
- The extremely short material process path facilitates quick cleaning and material switches, as well as reduced downtime.
- Low labor, utilities (power, water, compressed air) and spare part costs.






*Actual reduction depends on the material and your labor and utility rates

# OPTIONS

## 2 Conveyor belt
Rugged design with high sidewalls and metal detector, e-drive, process controlled.

## 3 Roll Feeder intake for film
Feed hopper with electrically powered intake rolls, process controlled.

## 4 Air separator feeding
Film edge trims can be carried to the A:GRAN using air. The air separator, which is mounted above the feed opening, separates the transport air from the edge trims.

## Additive dosing device
In the section between the shredder and the extruder intake, additives equal to up to 20 % of the material flow can be fed in (e.g. for the improvement of flow characteristics or material coloring), process controlled.

## 5 Simple Venting/degassing (V)
Vacuum degassing consists of two openings, where melt degassing takes place using a water ring vacuum pump (drying).

## 6 Manual screen changer (standard)
A lever is used to allow the alternate cleaning of two screens, which are swung out of the plastic melt.

## Screen Changer (Melt filter)
A high-quality, double-piston screen changer is offered as a option, allowing “on-the-fly” screen changes without stopping the machine.
**Self-cleaning backflushing melt filters** are available and recommended for highly contaminated materials to maximize time between required screen changes.

## PELLETIZING SYSTEMS
As a result of the modular design of the A:GRAN, various process controlled pelletizing systems can be used depending on the range of materials to be reprocessed.

7 **Hot die- Water ring pelletizer (HD)** is generally used for the majority of polyolefins (PE, low-mfi PP, etc).

8 **Strand pelletizer (SP)** or
**Underwater pelletizing (UWP)** are employed for PA (nylon), PET or other polymers and high-mfi PP.

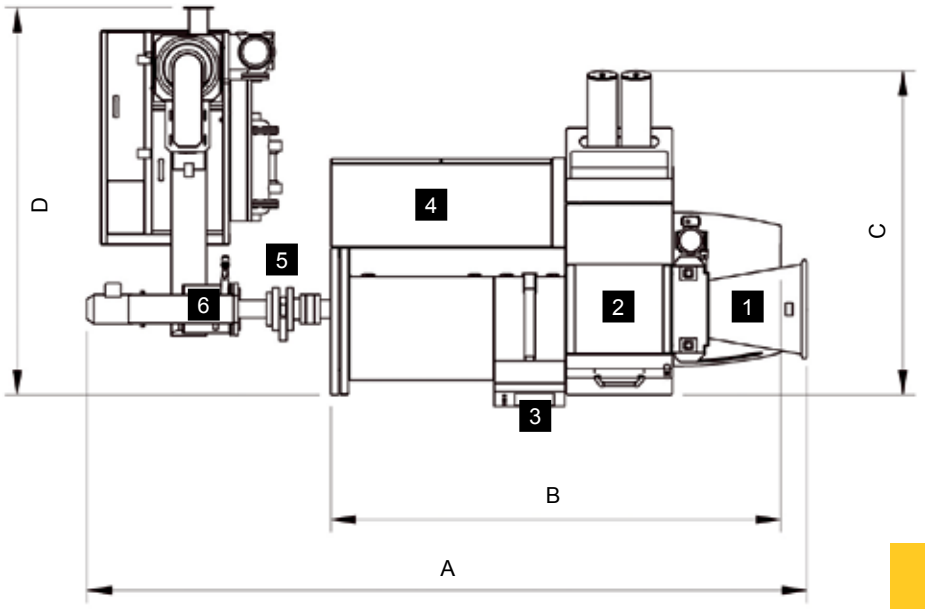
In addition, NGR also supplies the entire granulate transport equipment such as blowers, piping, cyclones, etc.

Simple degassing with two maintenance covers

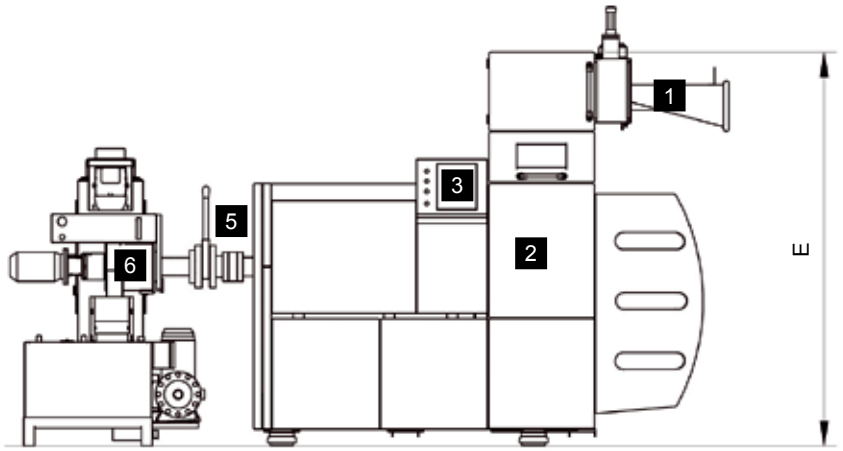
Screen Changer (Melt Filter)

Hot die pelletizer

Strand pelletizer




1. Roll Feeder intake
2. Shredder / feeder / extruder combination
3. Operating terminal
4. Power and controls cabinet
5. Screen Changer / Melt filter
6. Hot Die pelletizer




| type<br>venting option | | | A:GRAN 65<br>Basic \| V |
|---|---|---|---|
| **output of pellets*)** | | **lbs/hr** | **220** |
| **cutter** | **hopper volume** | **ft³** | 3,5 |
| | **cut width** | **inch** | 15 |
| **extruder** | **screw diameter** | **inch** | **2,56** |
| | **screw length** | **L/D** | 19 \| 33 |
| | **motor** | **hp** | 71 |
| | **rpm slow, high torque** | **rpm** | 184 |
| | **rpm normal** | **rpm** | 197 |
| | **rpm fast, high output** | **rpm** | 221 |
| **dimensions** | **A** | **inch** | 161 \| 197 |
| | **B** | **inch** | 100 \| 136 |
| | **C** | **inch** | 72 |
| | **D** | **inch** | 86 |
| | **E** | **inch** | 88 |
| **weight**)** | | **US t** | 3,1 \| 3,5 |

US t ... US tons, hp ... hp@60 Hz, rpm ... rpm@60 Hz
*) output for LDPE according to NGR standards, material and form. Values are ‚up to'
**) approx. value for transport; depending on chosen executions
**standard execution:**
Basic … short screw without venting
variable screw speed with frequency converter as standard
**additional options:**
• V … single vacuum venting
• execution ‚Speed' for increased output



## WE TAKE CARE OF YOUR PLASTIC WASTE

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