DESMI ROTAN Internal Gear Pumps — How They Work, Family Logic and Wear Parts

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The internal-gear principle behind ROTAN pumps and why it owns viscous duty: gentle low-shear flow, bi-rotational operation, lift capability — the GP and HD family split, reading a size like GP 21-50, and the bushing and shaft-seal kits that are the pump's actual service life.

Internal gear: one gear inside another

An internal-gear pump runs a rotor gear with an idler gear inside it, separated by a crescent: liquid fills the opening tooth spaces on the suction side, rides around the crescent, and is displaced as teeth re-mesh. The geometry gives it the qualities viscous-liquid plants buy: flow almost independent of pressure, graceful handling from thin fuels to greases and bitumen (speed reduced as viscosity climbs), low shear for polymers and food media, dry-lift priming, and — rare among pump types — true bi-rotational operation, so one pump loads and strips a tank through the same line by reversing rotation. Danish maker DESMI's ROTAN line has run this principle for a century; the stocked GP 21-50 and HD 68 heavy-duty gear mark the two family poles — GP the general-purpose build, HD the heavy-duty execution for the punishing end (abrasion, temperature, pressure).

What wears, and what to stock

Wear part | Why it goes | Stocked |

Bushings | The idler and rotor run on plain bushings lubricated by the pumped liquid — thin or dirty media wear them first, and worn bushings show as falling capacity and rising noise | ROTAN bushing set |

Shaft seal | Packing or mechanical seal by build; viscous and crystallising media dictate the arrangement | ROTAN shaft seal kit |

Clearance adjustment | End clearance is adjustable on these pumps — re-shimming recovers capacity before parts are even needed | procedure per size, quoted with kits |

That adjustability is the maintenance story: a ROTAN losing flow is first re-shimmed to spec, then re-bushed, and only much later re-geared — three lives before replacement, all planned work. Seal-face material logic follows the same rules as the mechanical-seal letter guide; general gear-pump alternatives for thin fuels sit among the 640 gear-pump rows (e.g. the self-priming DC transfer units).

Selecting and enquiring

Duty data beats model numbers: liquid, viscosity at pumping temperature, flow, differential pressure, and suction condition size the pump; the old unit's size code (GP 21-50 pattern: family + size) confirms it.

Speed is the viscosity lever — the same pump delivers its flow at lower rpm as viscosity rises; drives are sized accordingly (motor frames in the IEC chart, couplings in the coupling guide).

Relief protection is mandatory: positive displacement means pressure rises until something yields — an integral or line relief valve (see the safety-valve basics) is part of the installation, not an option.

Heating jackets exist for media that set when cold — specify with the pump for bitumen/wax duty.

DESMI pumps and ROTAN wear parts are quoted within 24 hours from brand stock — the NSL centrifugal side of the programme has its own spares guide.

Frequently asked questions
What liquids suit an internal gear pump?Anything viscous and lubricating by preference — oils, syrups, resins, bitumen, grease bases — plus thin liquids at reduced expectations, since the pumped medium lubricates the bushings. Abrasive-laden media push the choice to the HD execution and harder materials.Why does a gear pump lose capacity slowly over years? Internal clearances grow — bushings and end faces wear. On ROTAN builds end clearance is adjustable, so the first service step is re-shimming to factory clearance; capacity usually returns before any parts change.Can ROTAN pumps run in reverse?Yes — internal gear pumps are inherently bi-rotational, swapping suction and discharge with rotation. One pump then serves load/unload through a single manifold; the shaft seal and relief arrangement must be specified for both directions.Does a gear pump need a relief valve?Always — positive displacement against a closed valve builds pressure until the weakest part fails. Either the pump's integral bypass or a line-mounted relief, set above duty pressure and below the system's weakest rating.How do I identify a ROTAN pump for spares?The size code on the casing (family + size, e.g. GP 21-50) plus the shaft-seal arrangement visible at the gland. With those two and the medium, bushing sets, seal kits and gaskets are quotable within 24 hours.

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