Level Gauges and Sight Glasses — Tubular, Reflex and Circular Glass Chosen Honestly

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Where plain tubular gauge glass is legitimate and where it is not, reflex versus transparent armoured gauges in one paragraph, circular sight-glass discs for vessels and flow indicators, borosilicate's real limits, mica shields, and the gauge-valve details (ball checks, drain) that make a glass survivable.

Three glass families, three pressure worlds

Type | Construction | Honest domain |

Tubular | A borosilicate tube between two gauge valves | Low pressure, benign media, ambient-ish temperature — day tanks, reservoirs, condensate receivers. Stocked raw: Ø19 × 2 × 1500 mm down to Ø16 × 250 mm, cut to length on supply |

Flat armoured (reflex / transparent) | Flat glass clamped in a steel chamber | Boilers and process: reflex grooves show liquid dark/vapour silver with no illumination; transparent (two glasses) for dirty, coloured media and where mica shields must protect the glass (steam, caustics) |

Circular discs | A round glass in a flanged or screwed holder | Vessel windows and sight-flow indicators — stocked as discs like the Klinger KSG 50-15 borosilicate disc, replaced as a gasket-glass-gasket sandwich |

Borosilicate owes its job to thermal-shock resistance, but it keeps limits: pressure falls with diameter and temperature, steam service erodes unshielded glass (hence mica shields as a line item on transparent gauges), and caustic media etch it. Fittings-world cousins — the refrigerant moisture sight glass — share the name but answer a different question (moisture indication, not level).

The valves make the gauge

Gauge valve sets carry a ball-check that slams shut if the glass breaks — the feature that turns a broken tube from an incident into a nuisance. Verify the checks are present and free at every glass change.

A drain valve at the bottom fitting lets the glass be blown down — a gauge that cannot be proven live is a gauge that lies (sludge bridges read as steady level).

Replacement discipline for tubular glass: cut square, deburr, fresh packing rings both ends, never metal-to-glass, and leave axial expansion room. For armoured gauges, torque the clamp bolts in the maker's pattern and stages — cold, then re-torqued at temperature.

Pressure connections and small-bore valving follow the pipe-size chart; gasket compounds per the gasket guide; Danfoss SV-line gauge connectors (1/4 3 flare) serve the refrigeration corner.

Around 1,300 sight-glass and 185 level-gauge line items are stocked — raw tube, discs, complete gauges and spares. A photo of the installed gauge plus centre-to-centre distance and medium gets the exact glass, packing and shields quoted within 24 hours; electronic alternatives for difficult media live in the ultrasonic level guide.

Frequently asked questions
How is tubular gauge glass measured for replacement?Centre-to-centre between the gauge valves plus the engagement depth both ends (the valve maker states it), in the stocked diameter — then cut square from raw lengths like the 1500 mm stock and fitted with new packing rings. Never reuse old packings against fresh glass.What is the difference between reflex and transparent level gauges?Reflex has one grooved glass using total internal reflection — liquid shows dark, vapour bright, no lamp needed. Transparent uses two flat glasses with the medium between, suits dirty or coloured liquids, takes illuminators and, crucially, mica shields for steam and aggressive media.Why mica shields on a steam gauge glass?Hot condensate dissolves glass surprisingly fast — unshielded steam-duty glasses go cloudy, thin and fail early. A sacrificial mica sheet between medium and glass takes the attack; it is a consumable changed with the glass.What stops a tank emptying if the gauge glass breaks?The ball checks in the gauge valves — flow surge seats a ball and isolates the broken glass automatically. They only work if present, clean and not wired open; confirming them is step one of every glass renewal.Can I use a sight glass disc at any pressure?No — rating falls with disc diameter and temperature; each disc size carries its own pressure-temperature table, and the holder design (gaskets, clamp) is part of the rating. Quote medium, temperature and pressure with the disc dimensions.

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