

AGS Flow Solution Pte. Ltd.

PRODUCT TECHNICAL SPECIFICATIONS & STANDARD FEATURES

Company: AGS Flow Solution Pte. Ltd. (ISO 9001:2015 Certified)

Document Scope: Instrumentation Valves, Flow Protection & Control Devices, and Manufacturer-Specific Automation Systems

Design Standards Compliance: ASME, API, ISO, IEC, ISA, MSS SP, BS, EN, AWWA, DIN, NACE MR0175 / MR0103

1. NEEDLE & INSTRUMENTATION VALVES

High-Pressure Barstock Needle Valves (Non-Cryogenic)

Design Standards	ASME B16.34, MSS SP-99, MSS SP-105, BS 4368, API 598
Size & Pressure Range	NPS 1/8" ~ 2" (DN6 ~ DN50); Class 1500LB ~ 10,000 psi (up to 690 bar)
Stem & Tip Designs	Non-rotating hardened stem tip (Vee tip standard; soft Kel-F/PEEK tip optional for bubble-tight shutoff; regulating tip for precision metering)
End Connections	NPT / BSPT / BSPP Threaded (ASME B1.20.1), Two-Ferrule Compression Tube Fittings, Socket Weld (ASME B16.11)
Materials	SS316 / SS316L, Super Duplex (UNS S32750), Hastelloy C-276, Monel 400, Inconel 625
Standard Features	• Metal-to-metal seating with rolled stem threads to eliminate galling and extend cycle operating life. • Below-thread packing design isolates lubricant and actuation threads from line media. • Backseat design prevents stem blowout and provides secondary atmospheric containment. • Panel mount bracket and lock-pin handle arrangements standard for high-vibration skids.

Extended Bonnet Cryogenic Needle Valves

Design Standards	ASME B16.34, BS 6364, MSS SP-134, ISO 21011
Size & Temperature Range	NPS 1/4" ~ 1" (DN8 ~ DN25); Class 1500LB ~ 6000 psi; Service temperatures down to -196°C (LNG, Liquid Nitrogen, LOX)
Bonnet Configuration	One-piece welded or bolted extended stem column establishing a stable insulating vapor buffer zone to maintain gland packing at ambient temperature
Materials	Low-temperature forged 316/316L, F304L stainless steel; PCTFE / Kel-F or Stellite hardfaced tipped stems
Standard Features	• Precision cleaned and degreased per ASTM G93 Level C / CGA G-4.1 for clean oxygen-safe service. • Chevron-style live-loaded PTFE/Graphite packing with Belleville spring washers to compensate for cryogenic thermal contraction. • Non-rotating micro-metering needle profile eliminates seat galling during cold throttling cycles. • Extended bonnet length sized strictly in accordance with BS 6364 recommendations for vertical and horizontal installations.

2. AIR RELIEF & VACUUM BREAKER VALVES

Combined Triple-Action Air Relief & Vacuum Breaker Valves

Design Standards	AWWA C512, EN 1074-4, API 598
Size & Pressure Range	NPS 1" ~ 12" (DN25 ~ DN300); Class 150LB ~ 300LB / PN10 ~ PN40
Body Structures	Aerodynamic ductile iron (QT450 / GGG40), WCB carbon steel, or CF8M stainless steel body coated with fusion bonded epoxy (FBE)
End Connections	Flanged to ASME B16.5, EN 1092-2, or Threaded NPT/BSPT for sizes ≤ 2 "
Float & Trim Materials	Precision cylindrical SS304/SS316 floats, resilient EPDM or NBR lip-seal seats with anti-adhesion design
Standard Features	• Triple Action Operation: Rapidly expels massive air volume during pipeline filling, draws in air to prevent catastrophic vacuum collapse upon pump trip/drainage, and continuously discharges entrained micro-air bubbles under working line pressure. • Aerodynamic kinetic float mechanism prevents dynamic air blow-by and premature closure under high-velocity air discharge. • Integrated test point and optional built-in isolation valve assembly for online operational verification.

3. OVERPRESSURE SAFETY & RELIEF VALVES

Spring-Loaded & Pilot-Operated Safety Relief Valves (PSV)

Design Standards	API 520, API 526, API 527, ASME Boiler & Pressure Vessel Code Section VIII Division 1
Size & Orifice Ratings	Standard API Orifices "D" through "T"; Inlet NPS 1" to 8", Outlet NPS 2" to 10"; Class 150LB ~ 2500LB
Bonnet Configurations	Open Bonnet (steam/clean gas), Closed Conventional Bonnet, or Balanced Inconel Bellows (cancels backpressure variations and isolates guide from toxic fluids)
Seat & Disc Construction	Precision micro-lapped metal-to-metal seating (Stellite hardfaced) or interchangeable resilient soft seat (Viton, Kalrez, PTFE) ensuring zero leakage up to 95% of set pressure
Materials	Body/Bonnet: WCB, LCB, CF8M, WC6, Inconel; Trim: 316SS with Stellite, Monel, Hastelloy
Standard Features	• Certified high-flow nozzle-to-body guided structure with dual blowdown adjustment rings for precise overpressure and blowdown calibration. • Pilot-operated safety valve (POSV) options available for operating pressures up to 98% of set pressure without simmering or leakage. • Compliant with NACE MR0175 / ISO 15156 requirements for sour gas and harsh hydrocarbon installations. • Full-nozzle inlet configuration isolates body cavity from process fluid exposure during non-relieving operation.

4. INDUSTRIAL CONTROL VALVES

Globe-Style & Rotary Throttling Control Valves

Design Standards	IEC 60534, ISA-75, ASME B16.34, ANSI/FCI 70-2 (Seat Leakage)
Size & Pressure Range	NPS 1/2" ~ 16" (DN15 ~ DN400); Class 150LB ~ 2500LB
Flow Characteristics	Linear, Equal Percentage, Quick Opening, Modified Parabolic, or Custom Characterized Trims
Shutoff Leakage Classes	Class IV (standard metal-to-metal), Class V (high shutoff differential pressure), Class VI (resilient soft seat bubble-tight)
Severe Service Trims	Multi-hole low-noise cages, multi-stage tortuous path pressure drop discs (cavitation elimination and acoustic energy attenuation)
Standard Features	• Quick-change cage-retained seat ring allows seamless maintenance and fast characteristic changes without pulling the body from the line. • Precision live-loaded PTFE V-ring or pure graphite packing arrangements compliant with ISO 15848-1 low-fugitive emissions standards. • Rigid post or cage guiding minimizes vibration and ensures tight alignment through full travel stroke. • Universal direct-mounting pad compliant with NAMUR / IEC standards for smart digital positioners.

5. GENERAL VALVE AUTOMATION & ACTUATORS

Pneumatic Rack & Pinion and Scotch Yoke Actuators

Design Standards	ISO 5211, DIN 3337, VDI/VDE 3845 (NAMUR), ATEX Directive 2014/34/EU, SIL 3 Capable (IEC 61508)
Torque Range	Rack & Pinion: 5 Nm ~ 10,000 Nm Heavy-Duty Scotch Yoke: 500 Nm ~ 350,000 Nm (Symmetric or Canted torque profiles)
Operating Modes	Double Acting (DA) or Spring Return Fail-Safe (SR — Fail Open / Fail Close)
Operating Medium & Pressure	Clean, dry compressed air, instrument air, or non-corrosive gases; 2.5 bar to 8.0 bar working pressure
Construction & Materials	Extruded hard-anodized aluminum or epoxy-coated ductile iron / forged carbon steel; electroless nickel-plated pinion/shaft
Standard Features	• Bi-directional mechanical travel stop bolts adjustable by $\pm 5^\circ$ at open and close positions (0° and 90°). • Pre-compressed encapsulated safety spring cartridges guarantee maximum safety during field disassembly and overhaul. • Universal NAMUR interface allowing direct plug-and-play mounting of solenoid valves, switchboxes, and positioners. • Low-friction composite guide bearings minimize maintenance and maximize cycle endurance (>1,000,000 cycles).

Intelligent Multi-Turn & Quarter-Turn Electric Actuators

Design Standards	EN 15714-2, ISO 5211, IP68 (submersible to 8m for 72 hrs), ATEX / IECEx Ex d IIC T4 Gb
Power Supply	3-Phase (380V/415V/480V AC), 1-Phase (110V/230V AC), or 24V DC configurations
Operating Duty	On/Off & Inching (S2 - 15/30 min) or Continuous Modulating (S4 - up to 1200 starts/hour, 50% duty cycle)
Torque / Thrust Range	Quarter-turn: 50 Nm ~ 35,000 Nm; Multi-turn: 15 Nm ~ 3,000 Nm (Direct) / Up to 100,000 Nm with bevel/spur gearbox
Interface & Commissioning	Non-intrusive setup via infrared / Bluetooth setting tool; High-resolution multilingual LCD display showing valve position, torque, and diagnostics
Standard Features	- Double-sealed terminal enclosure prevents moisture and dust ingress even during terminal cover removal for on-site cabling. - Dynamic electronic torque sensing independent of voltage/temperature variations, providing over-torque motor trip protection. - Dec clutchable manual handwheel override with automatic motor-preference reset upon electrical signal initiation. - Standard 4–20 mA analogue positioning card, configurable alarm relay contacts, and optional digital fieldbus protocols (Modbus RTU, Profibus-DP, Foundation Fieldbus, HART).

6. MANUFACTURER SPECIFIC ACTUATORS: VALBIA

Valbia Pneumatic Actuators (Series 82 / 83 Rack & Pinion)

Design Standards	ISO 5211, DIN 3337, VDI/VDE 3845 (NAMUR), ATEX 2014/34/EU, SIL 3 (IEC 61508)
Torque & Size Range	DA 032 to DA 330 (Double Acting: 5 Nm to 10,000 Nm); SR 052 to SR 330 (Spring Return: 4 Nm to 5,000 Nm)
Rotation & Travel Stop	Standard 90° rotation with dual external travel stops adjustable by ±5° (at 0° and 90° positions); optional 120° and 180° variants
Supply Pressure	2.5 bar to 8.0 bar (Instrument Air, Inert Gas)
Body & Construction	Hard-anodized extruded aluminum body (ASTM 6063); die-cast aluminum end caps with epoxy-polyester coating; carbon steel electroless nickel-plated pinion
Standard Features	- Concentric nested pre-compressed spring cartridges with long retention screws for safe maintenance. - Dual pinion upper and lower O-ring seals with anti-blowout retention shoulder. - Low-friction Delrin guide bands on pistons to minimize operational hysteresis and eliminate metal-to-metal wear. - NAMUR top shaft and side mounting pad for standardized limit switches and direct solenoid valve mounting.

Valbia Electric Actuators (VB Series Quarter-Turn)

Design Standards	ISO 5211, CE, UL/CSA, EN 61000-6-2/4 (EMC), RoHS
Torque Range	30 Nm to 350 Nm (Models: VB030, VB060, VB110, VB190, VB270, VB350)
Voltage Configurations	Low Voltage: 12V–24V AC/DC ($\pm 10\%$); High Voltage: 100V–240V AC (50/60 Hz); automatic multi-voltage detection
Enclosure Rating	IP67 / IP68 self-extinguishing technopolymer (V0) or die-cast aluminum housing
Duty Cycle & Timing	Duty rating 50% (S4); operating run times from 8 seconds to 50 seconds (dependent on model and gearing)
Standard Features	- Built-in electronic torque limiter to prevent mechanical motor burn-out and valve stem deformation. - Integrated internal anti-condensation heating resistor activated automatically on power-up. - Manual override via bottom square drive/lever with high-visibility domed position indicator. - Two auxiliary SPDT limit switches standard; optional 4–20 mA / 0–10V positioning card and battery fail-safe backup pack.

7. MANUFACTURER SPECIFIC ACTUATORS: ROTORK

Rotork IQ3 / IQ3 Pro Multi-Turn Intelligent Actuators

Design Standards	ISO 5211, EN 15714-2, IP66 / IP68 (submersible to 7m for 72 hours), ATEX / IECEx Ex d IIC T4, SIL 2/3
Torque & Thrust Range	Direct Output: 14 Nm to 3,000 Nm; with second-stage spur/bevel gearboxes: up to 208,000 Nm
Power Supply	3-Phase (200V–690V AC), 1-Phase (110V/230V AC), or 24V DC / 110V DC battery-powered options
Operating Duty	Class A & B (On/Off, Isolation up to 60 starts/hr) or Class C (IQM modulating up to 1,200 starts/hr)
Position & Torque Sensing	Patented non-contact absolute encoder tracking continuous position without battery backup; dynamic piezoresistive torque measurement
Standard Features	- Double-sealed terminal compartment prevents moisture and dust ingress during field wiring. - Non-intrusive commissioning and diagnostic extraction via intrinsically safe Rotork Bluetooth Setting Tool Pro. - Multilingual graphical LCD display with real-time torque profiles, data logger, and valve asset management trends. - Motor-independent declutchable handwheel override with automatic electric power preference.

Rotork IQT3 / IQT3 Pro Part-Turn Intelligent Actuators

Design Standards	ISO 5211 (direct drive bases F05 to F16), EN 15714-2, IP66/IP68, ATEX, IECEx, SIL 2/3 capable
Torque Range	50 Nm to 3,000 Nm direct quarter-turn output (90° ± 10° adjustable travel)
Speed & Rotation Control	Configurable, variable-speed dual motor drive allowing independent open and close cycle stroke timing
Lubrication & Mounting	Completely sealed oil-bath lubrication allowing continuous operation mounted in any pipeline orientation
Network Interfaces	Modbus RTU, Profibus-DP, Foundation Fieldbus, Pakscan, DeviceNet, HART, and Industrial Ethernet (PROFINET / Modbus TCP)
Standard Features	• Direct-drive part-turn geometry eliminating external worm gearbox linkages for compact ball and butterfly valve setups. • Multiport operating functionality configurable from 3 to 16 stopping positions for multiport distribution valves. • Continuous position tracking retained indefinitely even upon total plant main power failure. • Comprehensive onboard event logger recording operating profile, starts, motor run time, and alarm conditions.

8. MANUFACTURER SPECIFIC ACTUATORS: AUMA

AUMA SA & SAR Modular Multi-Turn Actuators

Design Standards	ISO 5210, EN 15714-2, DIN 3210, IP68 (submersible to 8m for 96 hours), SIL 2 / SIL 3 (with AC 01.2 SIL controls)
Torque Range & Speed	10 Nm to 32,000 Nm; Output speeds selectable from 4 rpm to 180 rpm
Service Typology	SA Series: Open-Close & Positioning Duty (Class A & B / S2 - 15 min / S2 - 30 min) SAR Series: Continuous Modulating Duty (Class C / S4 - 25%, S4 - 50%, up to 1,500 starts/hr)
Controls Compatibility	Modular integration with AUMA MATIC (AM 01.1/02.1) basic controls or AUMATIC (AC 01.2) micro-controlled intelligent logic
Housing & Protection	Robust cast iron/aluminum alloy with high-grade two-coat polyurethane or KX extreme marine powder finish
Standard Features	• Modular detachable plug/socket electrical connector (AUMA connector) allows fast wiring and drive unit separation. • Electromechanical or non-intrusive magnetic torque and stroke limit sensors with mechanical dial position display. • Detachable output drive types (Form A thrust base, B1/B2/B3/B4 shaft couplings) for rising and non-rising valve stems. • Handwheel for emergency manual intervention with non-rotating rim safety during electrical drive operation.

AUMA SQ & SQR Modular Part-Turn Actuators

Design Standards	ISO 5211 (Flanges F05 through F16), EN 15714-2, IP68 (8m head of water for 96 hrs), ATEX / IECEx Ex-proof variants
Torque Range & Angle	50 Nm to 2,400 Nm direct quarter-turn; standard swing angle 75° to 105° (90° nominal); extended up to 135° on request
Operating Duty	SQ Series: Open-Close duty (Class A/B, S2 - 15 min) SQR Series: Modulating duty (Class C, S4 - 25% / 1,500 starts per hour; modulating torque up to 1,200 Nm)
Operating Speeds	Operating times for 90° adjustable from 4 seconds to 100 seconds (dependent on gear ratio and model)
Standard Features	• Self-locking gear design maintains valve position without drift under full backpressure while motor is stopped. • Internal self-regulating PTC switch compartment heater prevents internal condensate formation across thermal cycles. • Mechanical continuous disc position indicator coupled with electrical running blinker transmitter. • Native plug-and-play mounting compatibility with AUMATIC AC 01.2 controls for Profibus-DP, Modbus, and Foundation Fieldbus.