

Specification for Existing Pump To Be Replaced with an Explosion-Proof (Ex-Rated) Pump

Baseline performance parameters of the existing centrifugal surface pump (self-priming, integrated ejector type), to be matched or exceeded by the Ex-rated replacement unit.

Existing Pump – Performance Parameters

Parameter	Value
Pump type	Self-priming centrifugal surface pump with integrated ejector
Power supply	Single-phase, 220 V (±10%), 50 Hz (±2.5%)
Power consumption	1100 W (1.1 kW)
Current draw	5 A
Ingress protection	IPX4
Max. flow rate	70 l/min
Max. head	50 metres
Max. suction lift	9 metres (a check/non-return valve is mandatory)
Water temperature range	+1°C to +35°C
Cable length	0.8 metres
Port size (inlet/outlet)	1" (25 mm)
Max. switching cycles	≤20 times per hour
Overall dimensions (L x W x H)	450 x 185 x 220 mm

Replacement Requirement

Parameter	Value
Objective	Replace the existing pump with an explosion-proof (Ex-rated) equivalent, matching or exceeding the flow, head, suction lift, and connection dimensions listed above
Motor protection type	To be confirmed – specify required Ex protection concept (e.g. flameproof/Ex d, increased safety/Ex e, or non-sparking/Ex nA)

Additional Considerations for Ex-Rated Selection

Parameter	Value
Hazardous area zone	Confirm the classified zone at the installation location (e.g. Zone 1 / Zone 2 for gas atmospheres, or Zone 21 / Zone 22 for dust) – this determines the minimum acceptable Ex protection concept

Parameter	Value
Gas/dust group	Confirm the apparatus group (e.g. IIA/IIB/IIC for gases, or IIIA/IIIB/IIIC for dusts) relevant to the substances present on site
Temperature class	Confirm the required temperature class (T1–T6) or maximum surface temperature rating based on the ignition temperature of substances present
Ingress protection upgrade	The existing pump is only rated IPX4; an Ex-rated replacement motor will typically need to meet a higher IP rating (commonly IP55 or IP66) consistent with its certification
Certification scheme	Confirm which certification scheme applies to the installation (e.g. ATEX, IECEx, or a national equivalent) and request the corresponding certificate and conformity documentation with the replacement unit
Cable entry / gland	Ex-certified cable glands and entries matching the enclosure's protection concept will be required in place of the standard cable entry
Wetted materials	Reconfirm compatibility of wetted parts with the pumped fluid, since Ex-rated motor/pump combinations from different suppliers may use different materials

Added section: 'Additional Considerations for Ex-Rated Selection' was not present in the source document and has been added to support specifying an appropriate certified replacement. Confirm all hazardous area classification data with the site's area classification drawings and a qualified electrical/process safety engineer before procurement.

Note: This sheet is derived from the existing (non-Ex) pump's nameplate/performance data for reference during replacement sourcing. It does not constitute an Ex certificate or compliance declaration for any specific replacement product.

Non-Contact Ultrasonic Level Transmitter

Water Level Transmitter — Technical Data Sheet

Measuring principle: Non-contact ultrasonic level measurement (Time of Flight, ToF)

Performance

Parameter	Specification
Measured value resolution	1 mm (0.04 in)
Measuring error (accuracy)	±2 mm (0.08 in) or 0.2% of set measuring distance (empty calibration)
Maximum range, fluids	5 m (16 ft)
Maximum range, bulk materials	2 m (6.6 ft)
Blocking distance (BD)	0.25 m (0.8 ft)
Beam angle (3 dB)	11° — use this value when estimating the detection cone at a given distance
Reaction time (min.)	2-wire devices: min. 2 s; 4-wire devices: min. 0.5 s (depends on parameter settings)

Process Connection & Materials

Parameter	Specification
Process connection	G1½" or G2" thread; 1½ NPT or 2 NPT variants
Main wetted part	PVDF (typical for this sensor size/range)
Process temperature	–40°C to +80°C (–40°F to +176°F)
Process pressure / max. overpressure	0.7 to 3 bar abs. (10 to 44 psi)

Output & Communication

Parameter	Specification
Output signal	4...20 mA with HART protocol (2-wire); FOUNDATION Fieldbus and PROFIBUS PA variants also exist depending on order code
Local display	Four-line plain-text on-site display for menu-guided commissioning
PC configuration tool	Compatible with standard device configuration software via HART modem/interface

Power Supply

Parameter	Specification
Supply voltage (AC-powered variant)	90 to 253 VAC, 50/60 Hz

Parameter	Specification
Supply voltage (DC-powered variant)	10.5 to 32 VDC
Max. power consumption	4 VA (AC variant) / 1 W (DC variant)

Environmental & Housing

Parameter	Specification
Ambient temperature	−40°C to +80°C (−40°F to +176°F)
Housing material	Aluminum, T12 housing, coated
Ingress protection	IP68, NEMA 6P rating; separate terminal compartment; an overvoltage-protected variant is also available
Housing rotation	Rotatable up to 350° for optimal display/cable orientation
Cable entry torque	Max. 20 Nm (14.75 lbf ft) at the threaded boss

Calibration & Interference Handling

Parameter	Specification
Calibration parameters	Device is calibrated by entering the empty distance (E) and span (F); the span may not extend into the blocking distance, since level echoes within that zone cannot be evaluated reliably due to sensor transient characteristics
Interference handling	Built-in interference echo suppression prevents false echoes — from tank edges, welds, or internal fittings — from being misread as the true level signal
Reference operating conditions	Temperature +20°C (68°F); Pressure 1013 mbar abs. (15 psi abs.); Humidity 50%; ideal reflective (calm, smooth) surface; no interference reflections within the signal beam

Mounting Notes

Parameter	Specification
Tank positioning	Avoid centering the sensor in the tank; offset it from the tank wall by about 1/6 of the tank diameter
Weather protection	Use a protective cover for outdoor exposure to direct sun or rain
Beam path clearance	Keep obstructions (limit switches, temperature sensors, heating coils, baffles) clear of the emission cone
Narrow/uneven vessels	In narrow shafts or uneven conditions, use an ultrasound guide pipe with a minimum diameter of 100 mm (3.94 in); avoid dirt accumulation inside the pipe

Documentation Set

Parameter	Specification
Technical Information (TI)	Planning and ordering data
Operating Instructions (BA)	Installation and commissioning
Brief Operating Instructions (KA)	Quick startup guide
Description of Device Functions	Detailed functions reference, typically supplied on documentation media

Added items (not in original source data): beam angle, process temperature/pressure, wetted material, local display, power supply/consumption, housing rotation and cable entry torque, reference operating conditions, and narrow-vessel guide pipe guidance. Verify against the specific unit's nameplate and order code before use, as exact values vary by sensor variant (fluid vs. bulk solids range) and ordered options.

Note: Exact values for supply voltage, process pressure, wetted materials, and approvals depend on the specific order code of the unit in service. Confirm against the equipment nameplate and certified documentation before commissioning or replacement.

Quarter-Turn Electric Actuator

Technical Specification Sheet — 3rd Generation Platform

This description provides the basic specification. Refer to the project Schedule of Equipment for actuator size, mounting flange, area classification, power supply, and performance data. Remote control and indication functions are described under the associated wiring diagram. Additional options may be found in the Extras Included section.

General Specification

Parameter	Specification
Product type	Quarter-Turn Electric Actuator
Generation / Platform	3rd Generation
Note	Size, mounting flange, area classification, power supply, and performance data are project-specific — refer to the Schedule of Equipment

Environmental & Mechanical

Parameter	Specification
Ingress protection	IP66 / IP68 — rated to 7 metres / 72 hours, double-sealed terminal compartment
Ambient temperature	–30°C to 70°C (–22°F to 158°F) for Watertight, FM, or CSA EP enclosures; –20°C to 70°C (–4°F to 158°F) for ATEX or IECEx enclosures
Duty rating	Class A (On/Off) / Class B (Inching); nominal 60 cycles (120 starts/hour); rate ≤600 starts/hour; S2 – 15-minute rated
Mounting	Any orientation; local indication and controls rotatable in 90° increments
Manual override	Padlockable clutch lever; handwheel – clockwise to close; auto-disengages when motor starts; non-rotating during electric operation
Lubrication	Gearcase oil-filled for life
Mechanical travel stops	Stop bolt adjustment, ±5% variation of travel at each end position
Paint finish	Polyester powder coating, ~100 micron nominal thickness; Housings/Covers – Grey; Handwheel/Hand-Auto Lever – Black

Motor & Control

Parameter	Specification
Motor switching & speed control	Solid-state motor switching; 25%–100% motor speed control
Phase protection	Automatic phase rotation correction and lost-phase protection (three-phase supplies)
Torque switches	Configurable 40%–100% of rated; bypass option for start-of-travel

Local Controls & Indication

Parameter	Specification
Local controls	Open/Close selector; padlockable Local/Stop/Remote selector (Stop always available)
Local indication	Illuminated LCD position indicator (0.1% increments); closed/open limit symbols; torque and status data
LED indicators	3 LEDs – Red (open) / Yellow (intermediate) / Green (closed), reversible; configurable blinker and alarms
Position sensor	Absolute encoder; continuous high-resolution position measurement; maintained during manual operation without power/battery
Battery support	Not required for position sensing; supports LCD display, indication relays, commissioning, and data logging without mains power

Commissioning & Data

Parameter	Specification
Commissioning method	Non-intrusive setup (travel limits with auto-setup option, relays, alarms, etc.) via Infrared/Bluetooth Setting Tool (one supplied per order); can be password protected
Data logging	Date/time-stamped logging of operational events/trends, motor starts, valve torque profiles; valve/actuator/gearbox data storage; service alarms; battery-backed when power off; downloadable via Infrared/Bluetooth Setting Tool to PC for analysis

Electrical Terminals & Cable Entries

Parameter	Specification
Terminals	M5 (power) and M4 (control); screws/washers supplied; ring tag conductors – Power 16.0 mm ² , Controls 4.0 mm ²
Cable entries	4× M25 threaded (alternatively 0.75" NPT or PG16); cable glands not included

Wiring / Control Interface

Parameter	Specification
Control supply	20–60 VDC / 40–120 VAC, or actuator-derived 24 VDC
Control inputs	6 inputs – Open, Close, Stop/Maintain, ESD, and Interlock signals

Parameter	Specification
Indication contacts	4× volt-free (SPST) latching contacts (S1–S4); rated 120 VAC/30 VDC, 5 mA–5 A; each configurable NO/NC to signal: open/closed/intermediate position, moving (continuous or pulsing), handwheel operation, local/remote selected, interlock active, ESD active, motor tripped on torque, valve jammed, loss of power/phase, battery low, internal failure, thermostat tripped, or programmable service alarms

Note: This sheet reflects general platform-level specifications. Exact torque rating, speed, voltage, and enclosure certification for the unit being replaced should be confirmed against the equipment nameplate and project Schedule of Equipment before procurement.