Technical data Part-turn actuators for open-close and modulating duty

General information

AUMA part-turn actuators PF-Q80X – PF-Q600X are equipped with integral controls.

Type	Operating time for 90° in seconds[1] (selection of 9 levels)[2]			Torque range[3]	Modulating torque[4]	Valve attachment	Valve shaft			Handwheel		Weight[5]
PF-Q	V1	V2	V3	Max. [Nm]	Max. [Nm]	Standard EN ISO 5211	Cylindrical Max. [mm]	Square Max. [mm]	Two-flat Max. [mm]	Ø [mm]	Turns for 90°	approx. [kg]
80X	16 – 160	8 – 80	4 – 40	32 – 80	40	F05/F07/F10	20	17	17	100	20.2	8
150X	32 – 320	16 – 160	8 – 80	60 – 150	75	F05/F07/F10	20	17	17	100	20.2	8
300X	63 – 320	45 – 320	22 – 160	120 – 300	150	F07/F10	38	30	27	160	16.3	11
600X	–	75 – 320	45 – 320	240 – 600	300	F07/F10	38	30	27	160	16.3	11

1) The values for operating times refer to an operation across 90° of travel at a load of 70 % of the maximum torque. Operating times without considering soft start/soft stop. Soft start/soft stop is preselected for the factory settings.
2) Operating times can be selected in 9 levels when placing the order. Settable via Bluetooth in steps of 1 % within the range.
3) The tripping torque is adjustable for directions OPEN and CLOSE within the indicated torque range. The “Torque by-pass” function (can be activated) allows increasing the pre-set tripping torque to 127 % (unseating torque). This increase only applies during actuator start for an adjustable time period. This allows unseating blocked valves.
4) Maximum permissible torque for modulating duty. The values from the “Torque range” column still apply as tripping torques.
5) Specified weight includes part-turn actuator, unbored coupling and handwheel.

Features and functions

Explosion protection	Ex db h IIC T4 Gb Ex h tb IIIC T130°C Db	
Product certificates	DEKRA 21ATEX0092 X IECEx DEK 21.0058X	
Type of duty	Open-close duty:	Classes A and B according to ISO 22153, short-time duty S2 - 15 min
	Modulating duty:	Class C according to ISO 22153, intermittent duty S4 - 50 % with maximum number of 1,200 starts/h
	For nominal voltage and +40 °C ambient temperature and at load of 35 % of the maximum torque. The type of duty must not be exceeded.	
Motor	Variable speed, brushless motor Soft start/soft stop. The progress characteristics can be configured as requested.	
Insulation class	F (motor winding)	
Motor protection	Via short-circuit protection and current measurement	
Self-locking	At standstill with spring-applied brake	
Swing angle	Standard:	90° ±15° adjustable between min. and max. values (with mechanical end stops)
	Option:	120° ±15° adjustable between min. and max. values (with mechanical end stops)
		45° – 360° adjustable between min. and max. values (without mechanical end stops)
Limit switching	Via hall sensors	
Torque switching	Via electronic current measurement. Tripping torques infinitely adjustable via Bluetooth. 8 levels can be selected when placing the order.	
Mechanical position indicator	Standard:	Continuous indication, for 90° or 120° Via own markings at indication 45° – 360°
	Option:	Without mechanical position indicator
Manual operation PF-Q80X – PF-Q600X	Standard:	Manual drive for setting and emergency operation, handwheel does not rotate during electrical operation
	Option:	Without manual operation, this means handwheel and handwheel shaft are obsolete. The end stops are included except version with swing angle 45° – 360°.
Coupling	Standard:	Coupling unbored
	Options:	• Coupling unbored extended • Finish machining of coupling (standard or extended) - Bore according to EN ISO 5211 with 1 keyway according to DIN 6885-1 - Square bore according to EN ISO 5211 - Two-flat according to EN ISO 5211
Valve attachment	Dimensions according to EN ISO 5211	

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Power supply	Nominal voltages: 1-phase AC current: 100 – 240 V / 50 – 60 Hz	
Overvoltage category	Category II in compliance with IEC 60364-4-443	
Power electronics	With integral motor controller (current consumption in standby mode < 3 W)	
Control (input signals)	3 digital inputs:	• Via opto-isolator, with one common • Control voltage 24 V DC, current consumption: approx. 15 mA per input • Minimum pulse duration for shortest operation pulse: 100 ms • All digital inputs must be supplied with the same potential • All inputs can be configured as required • Standard assignment: CLOSE, OPEN, STOP • Assignment for option with positioner: MODE, OPEN, CLOSE
	Analogue input (option)	• 0/4 – 20 mA or 0 – 10 V • No galvanic isolation • Used as input signal for position setpoint (in combination with positioner) or as input signal for motor speed
Status signals (output signals)	3 digital outputs:	• Freely configurable semi-conductor output contacts, per contact max. 24 V DC, 100 mA (resistive load) • Outputs can be configured as required • Standard assignment: End position CLOSED (high active), end position OPEN (high active), collective fault signal (low active)
	Analogue output:	• Position feedback signal 0/4 – 20 mA (load maximum 500 Ω) or 0 – 10 V • No galvanic isolation
Voltage output (option)	Auxiliary voltage 24 V DC, max. 80 mA for supply of control inputs, without galvanic isolation.	
Functions	Standard:	• Switch-off mode adjustable: Limit or torque seating for end positions OPEN and CLOSED • Torque monitoring across the whole travel • Torque by-pass • Programmable EMERGENCY behaviour: - Digital input low active, - Reaction can be selected: Stop, run to end position CLOSED, run to end position OPEN • Speed control - Ramps - Program operation profiles - Program either specific speed for OPEN and CLOSE operations or one digital input
	Option:	• Positioner - Position setpoint via analogue input E1 = 0/4 – 20 mA or 0 – 10 V - Programmable behaviour on loss of signal - Automatic adaptation of dead band (adaptive behaviour selectable) - Selection between open-close duty and modulating duty via digital MODE input
Bluetooth Communication interface	Bluetooth class II chip, with a range of min. 3 m in industrial environments. Required accessories: • AUMA CDT (Commissioning and Diagnostic Tool for Windows-based PC) • AUMA Assistant App (Commissioning and Diagnostic Tool for Android and iOS devices)	
Electrical connection	Cable entry: 3 x M20x1.5 threads for cable glands. Inside rail with spring clamp terminals for wire connection.	
Wiring diagram (basic version)	TPC P00A1A1A100000, standard TPC P00A1B1A100000, version with positioner	

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Operation and display			
Basic at the actuator	Status indication	FOX-EYE (indication LED) Status indications: OK, end positions, faults and “Bluetooth connection active”	
	Set end positions	4 buttons and 1 LED are located below the hood. Run actuator in directions OPEN and CLOSE. Set end position once mounted to the valve.	
Smart Via Bluetooth using AUMA Assistant App or AUMA CDT software	Set end positions	Run actuator in directions OPEN and CLOSE. Set end position once mounted to the valve.	
	Configuration	Basic settings for operation:	• Rotation speed • Type of seating for end positions, Torque switching • Assignment of signal inputs and signal outputs • Fieldbus parameter (if fieldbus option has been selected)
		Additional functions:	For applications, safety and service, e.g.: • Positioner • EMERGENCY behaviour • Torque by-pass • Failure behaviour • Signal configuration
	Diagnostics	Monitoring key figures and measured values for preventive maintenance and consequently increasing process safety. Limit values can be set. Deviations generate warning signals which can be transmitted to the DCS via binary outputs or fieldbus.	
		Actuator:	Temperature value within actuator Key figures regarding lifetime of electronics, brake, gearbox and seals.
		Actuator and valve:	Method for identifying changes in torque requirement: Perform reference operation and save torque as reference profile. Define tolerance range. Perform comparative operation if required. Values outside tolerance initiate a signal which is communicated as described above.
		Further key figures:	Furthermore, the actuator monitors and records further figures and conditions. The generated fault and warning signals are saved within the event log. These signals can be configured as requested. An overview in the AUMA Assistant App or the CDT software shows all available fault/warning signals with option to enter the details.

Service conditions		
Mounting position	Any position	
Installation altitude	≤ 2,000 m above sea level > 2 000 m above sea level on request	
Ambient temperature	Standard:	–30 °C to +60 °C
	Option:	–30 °C to +65 °C
Humidity	Up to 100 % relative humidity across the entire permissible temperature range	
Enclosure protection in accordance with IEC 60529	Standard:	IP67
	Option:	According to AUMA definition, enclosure protection IP68 meets the following requirements: • Depth of water: maximum 8 m head of water • Continuous immersion in water: maximal 96 hours • Up to 10 operations during immersion • Modulating duty is not possible during immersion
Pollution degree according to IEC 60664-1	Pollution degree 4 (when closed), pollution degree 2 (internal)	
Vibration resistance according to IEC 60068-2-6	2 g, from 10 Hz to 200 Hz Resistant to vibration during start-up or for failures of the plant. However, a fatigue strength may not be derived from this. Not valid in combination with gearboxes.	
Seismic resistance according to IEC 60068-3-3	Test proof for application class 3	

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Service conditions		
Corrosion protection	Standard:	KS Suitable for use in areas with high salinity, almost permanent condensation, and high pollution.
	Option:	KX (upon request) Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution.
Coating	Double layer powder coating Two-component iron-mica combination	
Colour	Standard:	AUMA silver-grey (similar to RAL 7037)
	Option:	Available colours on request
Driving load	During operation, accelerating loads up to 15 % of the max. torque may occur.	
Lifetime	Open-close duty:	10,000 operating cycles OPEN - CLOSE - OPEN An operating cycle is based on an operation from CLOSED to OPEN and back to CLOSED, at a respective rotary movement of 90°.
	Modulating duty:	1.8 million modulating steps
	The lifetime depends on the load and the number of starts. A high starting frequency will rarely improve the modulating accuracy. To reach the longest possible maintenance and fault-free operating time, the number of starts per hour chosen should be as low as permissible for the process.	
Sound pressure level	< 70 db (A)	

Further information	
EU Directives	ATEX Directive 2014/34/EU Machinery Directive 2006/42/EC Low Voltage Directive 2014/35/EU EMC Directive 2014/30/EU RoHS Directive 2011/65/EU
Reference documents	Dimensions PF-Q80X – PF-Q600X Electrical data PF-Q80X – PF-Q600X