PF-Q80 – PF-Q600
Profibus DP
Technical data Part-turn actuators for open-close and modulating duty

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]
80	16 – 160	8 – 80	4 – 40	32 – 80	40	F05/F07/F10	20	17	17	100	20.2	8
150	32 – 320	16 – 160	8 – 80	60 – 150	75	F05/F07/F10	20	17	17	100	20.2	8
300	63 – 320	45 – 320	22 – 160	120 – 300	150	F07/F10	38	30	27	160	16.3	11
600	–	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 time 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 column “Torque range” still apply as tripping torques.
5) Specified weight includes part-turn actuator, unbored coupling and handwheel.

Features and functions		
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 with 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-Q80 – PF-Q600	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	

Features and functions		
Power supply	Standard voltages: 1-phase AC current: 100 – 240 V / 50 – 60 Hz The voltage range may be exceeded or undercut by max. 10 % The frequency range may be exceeded or undercut by max. 5 % Option: DC current: 24 V DC ±10 % For current consumption, refer to Electrical data PROFOX Part-turn actuators	
Overvoltage category	Category III according to IEC 60364-4-443 Category II in compliance with IEC 60364-4-443 (according to cDEKRAus for the North American market)	
Power electronics	With integral motor controller (current consumption in standby mode < 3 W)	
Profibus DP-V1 (option)	Access to parameters, the electronic name plate and the operating and diagnostic services with acyclic write/read services Galvanically isolated towards I/O interfaces.	
Fieldbus control (input signals)	Operation commands and setpoint via fieldbus interface	
Status signals fieldbus (output signals)	Via Profibus DP interface	
I/O 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: OPEN, CLOSE, I/O interface I/O interface: Selection of control source (fieldbus interface or I/O input signals). Factory setting of “I/O Interface” signal: Input signal 0 V = fieldbus interface is active
	Analogue input (option)	• 0/4 – 20 mA or 0 – 10 V • No galvanic isolation • Used as input for the position setpoint (then, definition is made via 2 binary inputs which command source is active for the positioning: fieldbus or analogue input) or for a sensor signal which can be further transmitted via fieldbus.
Status signals via I/O (Input 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 - Programming specific speed for OPEN and CLOSE operations or one digital input • Positioner - Automatic adaptation of dead band (adaptive behaviour selectable)

Features and functions	
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 PA0B1A1A100000, standard

With base and lever (option)	
Swing lever	Made of spheroidal cast iron with two or three bores for fixing a lever arrangement. Considering the installation conditions, the lever may be mounted to the output shaft in any desired position.
Ball joints (option)	Two ball joints matching the lever, including lock nuts and two welding nuts, suitable for pipe according to dimension sheet
Fixing	Base with four holes for fastening screws

Setting/programming the Profibus DP interface	
Baud rate setting	Automatic baud rate recognition
Setting the Profibus DP interface	The setting of the Profibus DP address is made via parameters using the AUMA Software CDT or AUMA Assistant App.

General Profibus DP interface data	
Communication protocol	Profibus DP according to IEC 61158 and IEC 61784-1
Network topology	Line (fieldbus) structure. When using repeaters, tree structures can also be implemented. If a unit fails, communication in the line is still maintained.
Transmission medium	Twisted, screened copper cable according to IEC 61158
Fieldbus interface	EIA-485 (RS485)
Transmission rate/cable length	• Baud rate and maximum cable length (segment length) without repeater: - between 9.6 and 93.75 kbit/s: 1,200 m - for 187.5 kbit/s: 1,000 m - for 500 kbit/s: 400 m - for 1,500 kbit/s: 200 m • Baud rate and possible cable length with repeater (total network cable length): - between 9.6 and 93.75 kbit/s: approx. 10 km - for 187.5 kbit/s: approx. 10 km - for 500 kbit/s: approx. 4 km - for 1,500 kbit/s: approx. 2 km
Device type	• DP master class 1, e.g. central controllers such as PLC, PC,. • DP master class 2, e.g. parts programming/configuration tools • DP slave, e.g. devices with digital and/or analogue inputs/outputs such as actuators, sensors
Number of devices	32 devices without repeater, with repeater expandable to 126
Bus access	• Token-passing between masters and polling for slaves • Mono-master or multi-master systems are possible.
Supported fieldbus functions	Cyclic data exchange, sync mode, freeze mode, fail safe mode
Profibus DP ident no.	0x1146. Standard applications with Profibus DP-V0 and DP-V1

Commands and signals of the Profibus DP interface	
Process representation output (command signals)	OPEN, STOP, CLOSE, position setpoint, RESET, EMERGENCY operation command
Process representation input (feedback signals)	• End positions OPEN, CLOSED • Actual position value • Selector in position LOCAL/REMOTE/OFF • Torque switches OPEN, CLOSED • Limit switches OPEN, CLOSE
Process representation input (fault signal)	• Torque switch tripped in mid-travel
Behaviour on loss of communication	The behaviour of the actuator is programmable: • Stop at current position • Execute operation to end positions OPEN and CLOSED • Travel to any intermediate position • Execute last received operation command

Operation and Display			
Basic at the actuator	Status indication	FOX-EYE (indication LED) Status indications: OK, end positions, faults and “Bluetooth connection active”	
	End position setting	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	End position setting	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 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 comparison 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	–30 °C to +70 °C
Humidity	Up to 100 % relative humidity across the entire permissible temperature range

Service conditions		
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	
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.	

Further information	
EU Directives	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-Q80 – PF-Q600 Electrical data PF-Q80 – PF-Q600