BC PREMIUM LABEL The complete solution

BERNARD® CONTROLS

Invest in Confidence

Explosionproof Intelli+® Actuators

SQX & STX RANGES

Range overview

Multi-turn actuators

STX Range description

- Available torque range from 25 to 25 000 Nm
- Ex d/NEMA 7 explosion proof enclosure
- ATEX, IEC Ex , CSA/FM, INMETRO, EAC Customs Union
- IP68 (10m / 96h) as standard
- EN 15714-2 Duty Classification: On-Off (Class A), Inching/Positioning (Class B), Modulating (Class C)
- INTELLI+® controls as standard
- Electromechanical versions (switches) on request (refer to specific technical handbook)

BERNARD CONTROLS STX actuator on a bevel gearbox

BERNARD CONTROLS multi-turn STX actuator

Other Explosion proof solutions

- Quarter-turn failsafe
  - *Failsafe with reliable spring-return technology*
  - *Fast and shock-free valve travel during emergency operation*
  - *Maintenance-free*
  - *EEx d/NEMA 7 explosion proof enclosure*
  - *IP67 as standard*

Quarter-turn actuators

SQX Range description

- Available torque range from 200 to 500 000 Nm
- EXd/NEMA 7 explosion proof enclosure
- ATEX, IEC Ex , CSA/FM, INMETRO, EAC Customs Union
- IP68 (10m / 96h) as standard
- EN 15714-2 Duty Classification: On-Off (Class A), Inching/Positioning (Class B), Modulating (Class C)
- INTELLI+® controls as standard
- Electromechanical versions (switches) on request (refer to specific technical handbook)

BERNARD CONTROLS quarter-turn SQX actuator

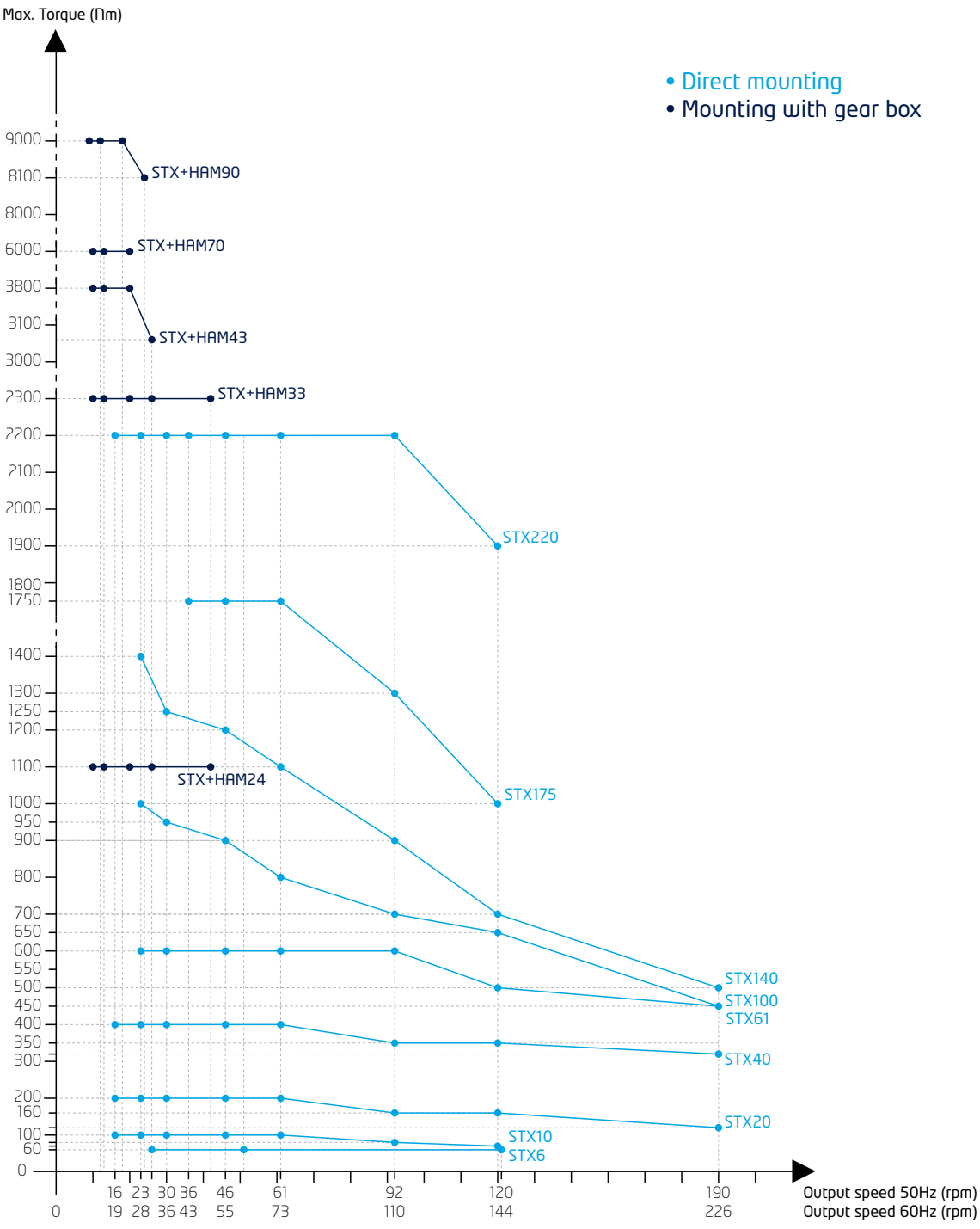
BERNARD CONTROLS STX actuator on a worm gearbox

- EEx ed quarter-turn actuators
  - *Available torque range from 60 to 800 Nm*
  - *EEx ed explosion proof enclosure*
  - *IP67 as standard*
  - *Available only in electromechanical version (switches)*
  - *Compact and robust*

- Continuous Modulating Actuators
  - *Quarter-turn, multi-turn, linear and lever movements*
  - *EN 15714-2 Duty Classification: Continuous Modulating (Class D)*
  - *Improved performance criteria, especially resolution*

Performance data

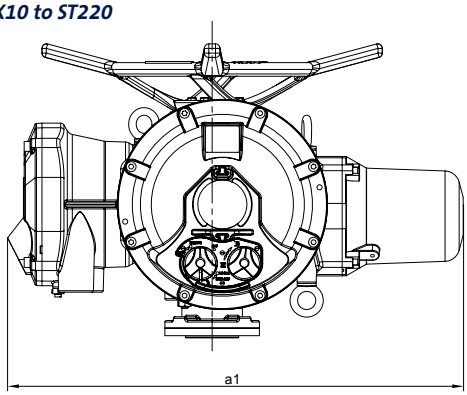
Multi-turn explosionproof actuators

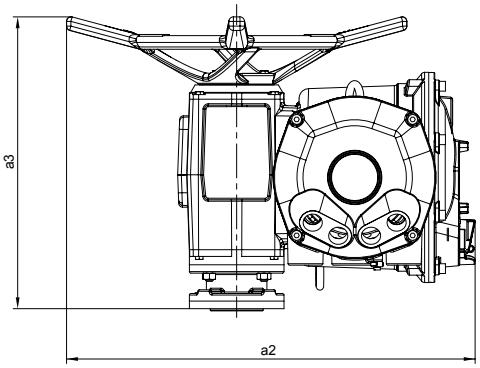


Dimensions

Multi-turn explosionproof actuators

STX10 to ST220

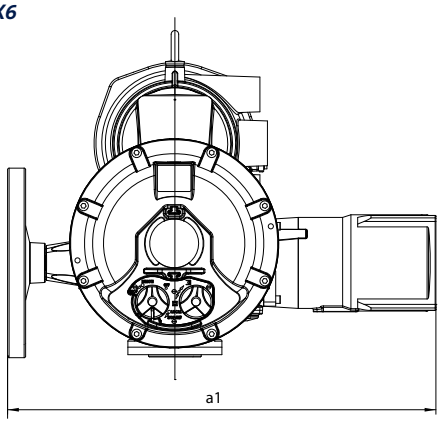


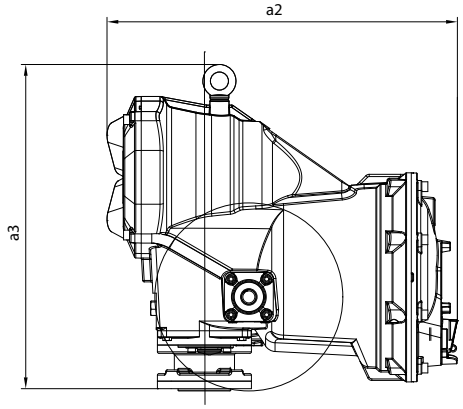


	Flange	Stem diameter (mm)			a1 max. (mm)	a2 (mm)	a3 (A-B1 form) (mm)	a3 (B3 form) (mm)	Max Weight (kg)
		Type A (max.)	Type B2 (max.)	Type B3					
STX6*	F10	30	42	20	569	466	431	373	41
STX10	F10	38	42	20	603	540	386	328	49
STX20	F10	38	42	20	613	540	386	328	52
	F14	38	60	NA	613	540	445	NA	63
STX40	F14	48	60	30	726	621	458	361	75
STX61	F16	57,5	80	40	811	672	489	368	95
STX100	F16	60,5	80	40	808	668	523	405	109
	F25	60,5	100	NA	808	668	573	NA	125
STX140	F25	70	100	50	829	698	565	429	149
ST175	F25	85	100	50	1056	797	661	523	295
ST220	F30	90	120	60	1220	797	658	523	376

* Stem lift limited to 130 mm. Please refer to detailed drawing for more details.

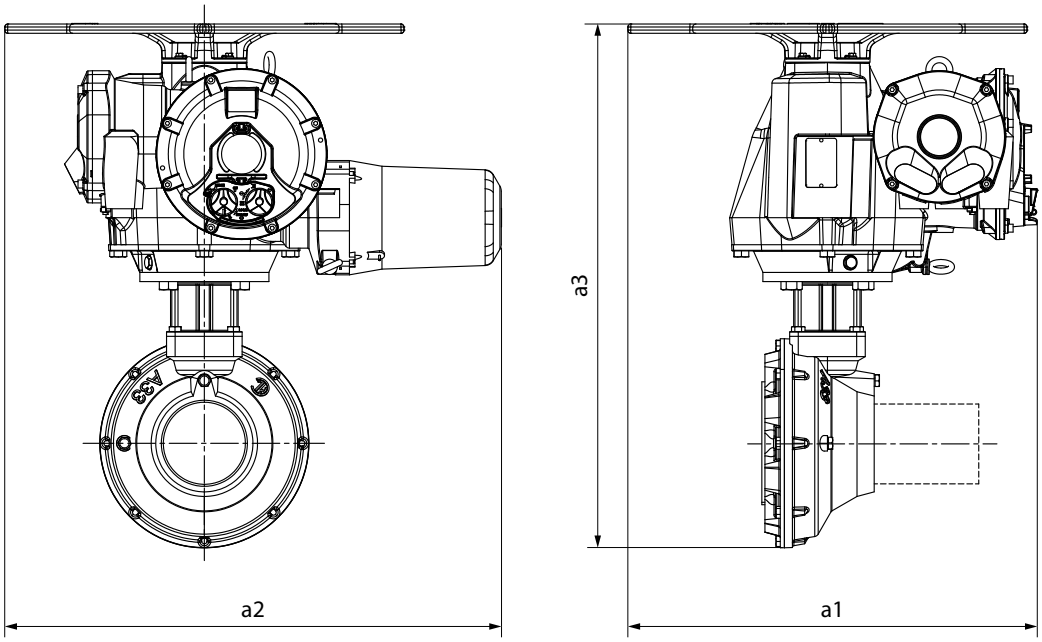
STX6





Dimensions

Multi-turn explosionproof actuators



	Flange	Stem diameter (mm)		a1 max. (H if higher)	a2 (mm)	a3 (mm)	Max. Weight (kg)
		Type A (max.)	Type B2 (max.)				
STX40+HAM24	F16	70	85	621	726	705	91
STX61+HAM33	F25	85	118	672	811	816	134
STX100+HAM43	F30	102	132	668	808	891	162
STX140+HAM70	F35	115	145	698	829	917	233
ST175+HAM70	F35	115	145	1000	1220	1013	420
ST175+HAM90	F35	122	190	1000	1220	1104	455
ST220+HAM90	F35	122	190	1000	1220	1104	476

Mounting flange

Specifications

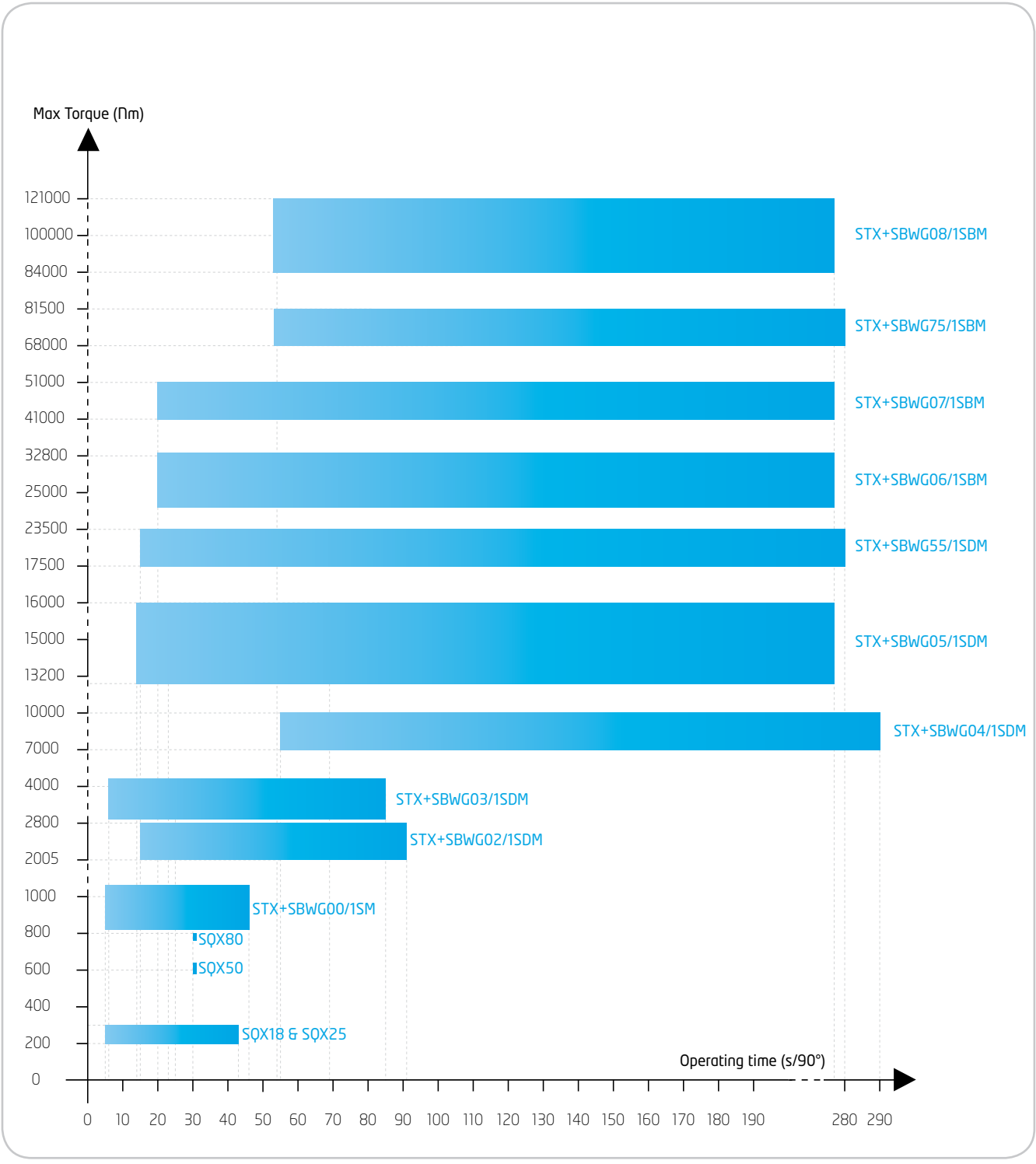
Type A STEM NUT	Type B1 LARGE DIA.	Type B3 SMALL DIA.	Type C CLAW COUPLING
			
Thrust accepted	Thrust not accepted	Thrust not accepted	Thrust not accepted
			

ISO 5210 requirements

Flange	Max torque	Max. acceptable thrust (Type A)	Mounting bolts
F10	100 Nm	40 000 N	4 x M10 / d=102 mm
F14	400 Nm	100 000 N	4 x M16 / d=140 mm
F16	700 Nm	150 000 N	4 x M20 / d=165 mm
F25	1200 Nm	200 000 N	8 x M16 / d=254 mm
F30	2500 Nm	325 000 N	8 x M20 / d=298 mm

Performance data

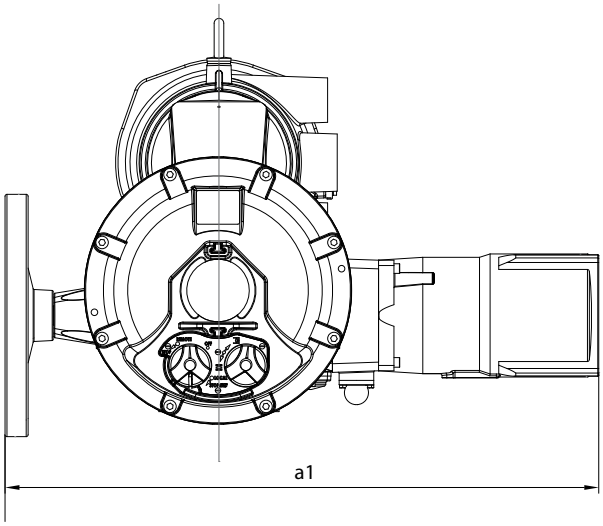
Quarter-turn explosionproof actuators

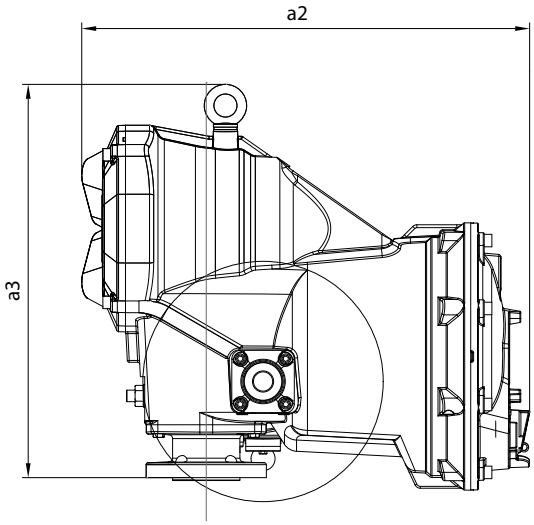


* Many other possibilities up to 610.000 Nm. For more details, please contact us

Dimensions

Quarter-turn explosionproof actuators

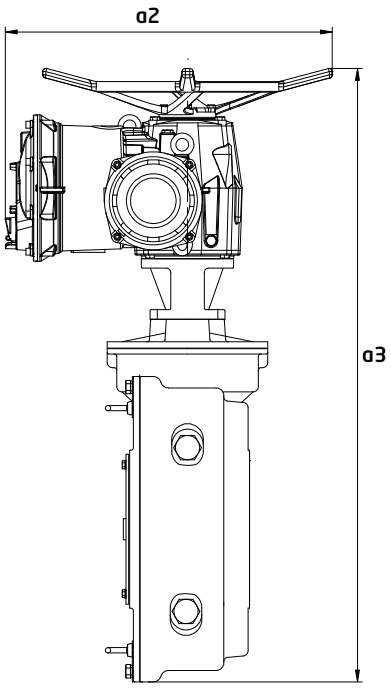


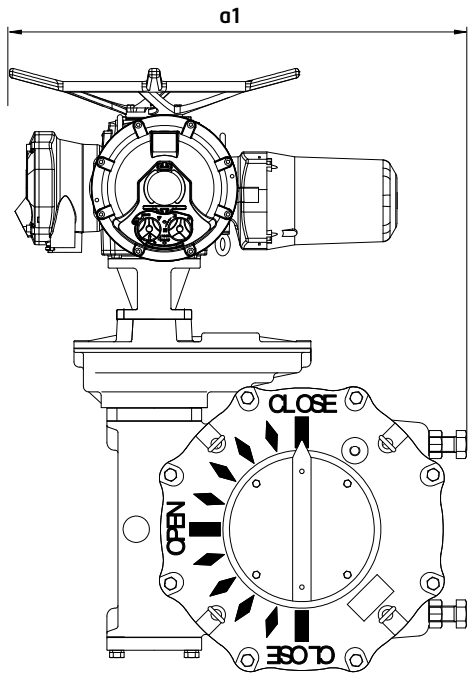


	Flange	Stem size (mm)		a1 max. (mm)	a2 (mm)	a3 (mm)	Max. Weight (kg)
		Bore (max.)	Square (max.)				
SQX18	F07/F10	32	32	568	466	409	33
SQX25	F07/F10	32	32	616	466	409	35
SQX50	F07/F10	32	32	617	466	409	36
SQX80	F12	36	40	617	466	440	39

Dimensions

Quarter-turn explosionproof actuators





	Flange	Stem size (mm)		a1 max. (mm)	a2 (mm)	a3 (mm)	Max. Weight (kg)
		Bore (max.)	Square (max.)				
STX6+SBWG00M	F10/F12	36	28	568	466	604	43
STX6+SBWG00M/1SM	F10/F12	36	28	568	466	663	47
STX6+SBWG02/1SDM	F12/F14/F16	60	46	568	466	738	61
STX20+SBWG03/1SM	F14/F16(F20)	75	58	613	540	699	67
STX20+SBWG35/1SDM	F16(F20)	80	62	613	540	735	93
STX6+SBWG04/1SDM	F16/F20/F25	95	73	568	466	860	77
STX20+SBWG04/1SDM	F16/F20/F25	95	73	603	540	814	134
STX20+SBWG05/1SDM	F25/F30	115	80	666	540	845	160
STX20+SBWG55/1SDM	F25/F30	125	97	698	540	877	190
STX40+ SBWG06/1SBM	F30/F35	140	108	792	621	1071	266
STX40+SBWG07/1SBM	(F35) F40	180	139	868	621	1165	372
STX40+SBWG75/1SBM	(F40) F48	210	160	958	621	1310	514
STX61+SBWG08/1SBM	(F40) F48	250	185	1086	672	1418	640

* Many other possibilities up to 610.000 Nm. For more details, please contact us

Explosionproof actuators

Technical Specifications

GENERAL SPECIFICATIONS	**Torque range**	Multi-turn • direct mount : 25 to 2200 Nm • with gearbox : up to 25,000 Nm Quarter-turn • direct mount : 200 to 800 Nm • with gearbox : up to 500,000 Nm
	Type of duty	Comply with following EN15714-2 Duty Classes: A - On/Off, B - Inching/Positioning and C - Modulating
ENCLOSURE - PROTECTION	**Casing**	Cast aluminium. Ductile cast iron for models ST175 / ST220
	Ingress Protection	IP68 10m / 96h & NEMA 6 (C.S.A C and US certified)
	Controls location	As standard, the INTELLI+® controls are integral to the actuator On option, the INTELLI+® can be mounted in a separated box (maximum distance between actuator and controls = 50m)
	Explosion proof ATEX	ATEX Directive 94/9/EC - CENELEC EN 60079-0, EN60079-1, EN61241-0, EN61241-1 standards As standard: Ex d IIB T4 (option T5 or T6) and Ex tb IIIC T135°C (option T100°C, T85°C) On request: Ex d IIC T4 (option T5 or T6)
	Explosion proof C.S.A. C and US	NEMA 7 - NEMA 9 certified C22-2, FM3600, FM3611 and FM3615 standards Class I Group C, D div 1&2 (option Group B)- Class II Group E, F, G div 1&2
	Explosion proof IEC Ex	IEC Ex - standard IEC 60079-0, IEC60079-1, IEC61241-0, IEC61241-1 standards As standard: Ex d IIB T4 (option T5 or T6) and Ex tb IIIC T135°C (option T100°C, T85°C) On request: Ex d IIC T4 (option T5 or T6)
	Ambiant temperature operating range	• IIB standard: -20 ... +70°C • IIB low temperature option: -60 ... +70°C • IIC option: -20 ... +60°C
	External corrosion protection	Standard paint system: polyuréthane paint Ral5002 complying with ISO 12944 (C3) Optional special anti-corrosion protection for marine, aggressive or abrasive atmospheres All cover fasteners captive and stainless
	Double sealing Protection	The control section of the actuator is totally isolated from the terminal compartment to protect electronic components Terminal compartment < 2 litres, no source of ignition
MOTOR	**Motor technology**	TENV type Totally Enclosed Non Ventilated, squirrel cage motors (VAC) Class F insulation class Integral thermal overload protection Easy to remove with sealed ball bearings fitted at front and rear
	Motor duty rating	S4 motor service (intermittent service on start-up) to IEC 34-1 • S4 - 30% for On/Off operation - up to 360 starts per hour • S4 - 30% for Inching/Positioning - up to 360 starts per hour • S4 - 50% for Modulating class III - up to 1,200 starts per hour
MECHANICAL SPECIFICATIONS	**Gearing**	Self-locking at all speeds
	Manual override	Handwheel which does not rotate during motor operation. • Automatic switch between manual and electrical operation without clutch release lever. Priority to electric drive • Manual control gear ratios: STX6 1:9 - STX10/STX20/STX40 1:2 - STX61 1:4 - STX100 1:7- STX140 1:9 - ST175/ST220 1:31 • Maximum rim force to apply conform to EN 12570 standard
	Output flange	• Multi-turn actuators flanges comply with ISO 5210 • Quarter-turn actuators flanges comply with ISO 5211 Flanges for valve special top works available on request
	Output drive	Removable sockets on SQX and STX models
	Vibration Resistance	1g (9.8 m/s²) at 10-500 Hz (Contact our marketing dept. for higher vibration levels)
	Lubrication	Actuators are lubricated for product lifetime and do not require any specific periodic maintenance

ELECTRICAL SPECIFICATIONS	**Power supply**	The actuators can operate on a wide variety of power supplies: • 3-phase , single-phase or DC, • up to 690 V, • 50 or 60 Hz ...
	Cable entries	Standard configuration: • power & signal : 1"1/2 NPT + 2x1"NPT • fieldbus : up to 4x3/4"NPT Other configurations available on request: plugs, adaptors, ISO thread
	Electrical connection	Ring tongue terminals Internal and external ground rod
	Fuse protection	Primary fuse (6.3 x 32mm - 0.5 A) located on the transformer board Two automatic fuses for low voltages
POSITION AND TORQUE SENSORS	**Position**	• Movement read directly on the main shaft (direct mechanical link) • Absolute sensor (without battery) • Range: 1.5 to 900 turns. (Range above 900 turns available on request)
	Torque	• Torque measured by a dynamometric balance • Absolute sensor (without battery) • Setting range: 40 to 100% of actuator maximum torque by steps of 1% • Reading range: 10 to 100% of actuator range with a resolution of 1%
CONTROLS	**Power circuit**	Integral motor reversing starters (electromagnetic contactors for On-Off, Inching/Positioning, Modulating Class III)
	Display	Back-lit graphics display with a choice of 9 different languages
	On-off remote Control	Command by • voltage: 10 to 250 V DC/AC (current: 10 mA at 24V) • dry contact (use INTELLI+® auxiliary 24 VDC supply) Isolated by opto-couplers Minimum pulse duration: 100ms Time of rotational direction change: 200ms (factory setting range 50 to 500 ms)
	Signaling relays	4 relays: each information can be freely selected among a total of 23 available information • Contact configuration : normally open or normally closed • Minimum current 10mA at 5V • Maximum current 5A at 250V AC or 5A at 30VDC (resistive load) Additional 3 relays board on option
	Fault relay	• Normally closed & energized SPDT contact • Minimum current 10mA at 5V • Maximum current 5A at 250V AC or 5A at 30V DC (resistive load)
	Analogue Control: Positionner Modulating Class III (option)	Input (setpoint) and output (feedback) signals are fully isolated from each other Signal configurations (selectable): • Input signal: 4-20 mA - output signal: 4-20mA • Input signal: 0-20 mA - output signal: 0-20mA • Input signal: 0-10 V - output signal: 0-20mA (0-10V with an external resistance) Analogue inputs: • in current: impedance of 160 Ohms • in voltage: impedance of 11 KOhms Analogue outputs: • in current: maximum acceptable load of 750 Ohms at 24 VDC supply • In voltage: minimum acceptable load of 50 KOhms (with a shunt resistance of 500 Ohms)
	Fieldbus Control	See table on next page
	Transmitter (option)	Proportional position (0/4-20 mA) and torque (4-20 mA) feedback board
	Signaling continuity (option)	Allows to use the display and update the open and closed position information (through the signaling relays or Profibus DP) in case of lack of power supply
	Fire protection (option)	30 minutes at 1,000°C Tested to UL1709 criteria
SETTINGS	**Settings**	Non-Intrusive. All actuator settings and parameters are stored in a non-volatile EEPROM memory. Protection by password. Can be done by local command, infrared link or optional bluetooth link (For a good safety level, bluetooth link is limited at 10m)
	Local selectors	The INTELLI+® can be fully set via its local display and selectors Does not require any specific setting tool
	INTELLIKIT (option)	• INTELLISOFT CD-ROM for laptop PC • Infrared module to connect to the laptop (USB) and clip on the actuator window From update 3.00, INTELLISOFT is also able to manage bluetooth link with advanced torque recordings
	INTELLI Pocket (option)	Industrial pocket PC (PDA) • Protection: IP65 (option: ATEX II2G EEx ia IICT4) • Shock resistance: 1.2 m (on concrete) • Communication: - with INTELLI+® : Infrared link (40 cm maximum distance) - with PC: bluetooth, IRDA, Wifi (802.11b) as a standard • Optional USB station. • Operating system: Windows Mobile 2005, 64Mb RAM + 256Mb storage card

CONFORMITY TO EC DIRECTIVES	**EC Directives**	The actuators comply with: • The 2004/108/EC electromagnetic compatibility • The 2006/95/EC C Low Voltage • The following harmonized standards: - Generic emission standard-Industrial environment EN 61000-6-4 - Generic immunity standard - Industrial environment EN 61000-6-2 - Rotating electrical machines EN 60034-1, - Degrees of protection provided by enclosures (IP code) EN 60529
FIELDBUS CONTROLS	**Profibus DPV1 (option)**	• PROFIBUS-DPV1 - RS 485 • Baud rate: 9.6 kbit/s up to 1.5 Mbit/s (autodetection) • Communication protocol: PROFIBUS DPV1 slave-cyclic & acyclic • Type of connection: single line (standard) or redundant line (option) • Cable specification: Profibus certified cable only • Line connection without repeater - Actuators per line: 31 max. - Line length: 1.2 km max. (0.75 mi) • Line connection with repeaters - Number of repeaters per line: 9 max - 30 actuators and 1 Km max. per segment . - Number of actuators per line with repeater: 124 maximum - Line length with 9 repeaters: 10.2 km max. (6.2 mi) • Scan speed (30 units & 1.2 km): 0.1s (at a baud rate of 93.75 Kbit/s) • Power supply: internal and isolated via INTELLI+®. Optional signaling battery or 24VDC external backup supply update the open and closed position information in case of loss of power supply • Technical approval: operability approved by PNO (Profibus Nutzer Organisation)
	Modbus (option)	• MODBUS RTU - RS 485 • Transmission medium: 1 shielded pair cable • Functions: Half Duplex, asynchronous mode, multidrop • Baud rate: 1.2k to 115 Kbit/s • Format: 8 data bits, 1 stop bit, no parity • Communication protocol: Modbus (slave) • Modbus address: configurable by the actuator menu
	Foundation Fieldbus (option)	• H1 speed = 31.25kBit/s • Fully compliant with fieldbus standard IEC 61158 • Physical layer: IEC 61158-2, 2 wires communication • Current consumption: 20mA • Operating voltage: 9 to 32 VDC • Cable specification: Type A (for example: 3076F Belden) • Line connection - Actuators per line without repeater: 31 max. - Line length without repeater: 1.9 km max. (1.2 mi) - Number of repeaters per line: 4 max. - Maximum number of actuators and line length depends on consumption available • Technical approval: Foundation tested. Several DCS manufacturer operability checked.
	Hart (option)	Interface: HART, 4-20mA current, FSK modulation Transfer speed: 1.2 kbit/s Protocol: HART 7.4 Impedance: 250 Ohms Power consumption: Internal by Intelli+ transformer, External power supply for 4-20mA loop only Actuator configuration: Available through EDD file Connection line: Point-to-Point or Multi-drop Technical approval: approved by Hart Communication Foundation

Please refer to our Technical Handbooks for detailed information on electrical data, dimensions and wiring diagrams.
AF401: Quarter-Turn Explosionproof
AF402: Multi-turn Explosionproof