

ExPlus Linear actuators On-Off, 3 Pos, 3 Pos-U, continuous control

Electrical, explosion proof linear actuators – from 300 N to 3,000 N

Stroke up to 100 mm resp. 300 mm

24...240 VAC/DC selfadaptable

PTB-tested in acc. with ATEX guideline 94/9/EC for zone 1, 2, 21, 22.

ExPlus - ... - 100
ExPlus - ... - 300
ExPlus - ... - X
ExPlus - ... - Y
ExPlus - ... - U
ExPlus - ... - ... - CTS

Subject to change!

Compact. Easy installation. Universal. Cost effective. Safe.

Type	Force	Stroke	Supply	Motor running time	Control mode	Feedback	Wiring diagram
ExPlus - 3.5-100	0.3 kN / 0.5 kN	100 mm	24...240 VAC/DC	0.5 / 1 / 2 s/mm	On-Off, 3-Pos	-	SB 1.0
ExPlus - 3.5-300	0.3 kN / 0.5 kN	300 mm	24...240 VAC/DC	0.5 / 1 / 2 s/mm	On-Off, 3-Pos	-	SB 1.0
ExPlus -10.15-100	1.0 kN / 1.5 kN	100 mm	24...240 VAC/DC	0.5 / 1 / 2 s/mm	On-Off, 3-Pos	-	SB 1.0
ExPlus -10.15-300	1.0 kN / 1.5 kN	300 mm	24...240 VAC/DC	0.5 / 1 / 2 s/mm	On-Off, 3-Pos	-	SB 1.0
ExPlus -30-100	3.0 kN	100 mm	24...240 VAC/DC	0.5 / 1 / 2 s/mm	On-Off, 3-Pos	-	SB 1.0
ExPlus -30-300	3.0 kN	300 mm	24...240 VAC/DC	0.5 / 1 / 2 s/mm	On-Off, 3-Pos	-	SB 1.0
ExPlus - ... - X	Type as above but <u>without</u> possibility to assemble external aux. switches (ExSwitch)						SB 1.0
ExPlus - ... - Y	Type as above but with control and feedback				0..10 V / 4..20 mA	0..10 V / 4..20 mA	SB 4.0
ExPlus - ... - U	Type as above but with additional feedback				On-Off, 3-Pos	0..10 V / 4..20 mA	SB 5.0
ExPlus - ... - CTS	Type as above but with Amercoat painting, outside parts in stainless steel, cable glands nickel-plated						

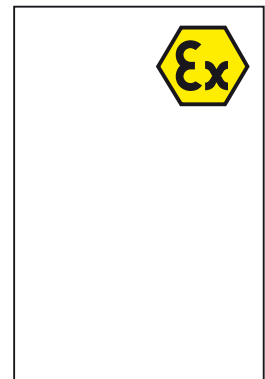
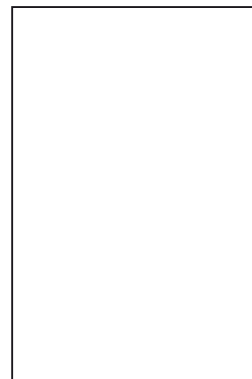
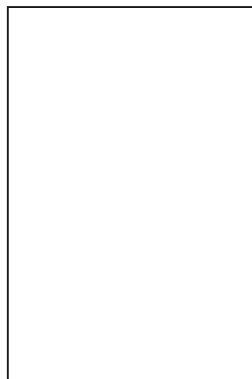
Product views



Picture with 100 mm stroke



Picture with rubber bellow GMB...



Description

The new ExPlus actuators are a revolution for linear motions in safety and motorized applications in chemical, pharmaceutical, industrial and offshore-/onshore plants, for use in Ex-areas zone 1, 2 (gas) and zone 21, 22 (dust).

Highest protection class (ATEX) and IP66 protection, small dimensions and weight, universal functions and technical data and an integrated heater guarantee safe operation even under difficult environmental conditions. High quality brushless motors guarantee long life.

All actuators are programmable and adjustable on site. Special tools or equipment are not required. 3 motor running times and 2 forces, according to the actuator type, are selectable or adjustable on site. The integrated universal power supply is self adaptable to input voltages in the range of 24...240 VAC/DC.

The actuators are 100% overload protected and self locking.

The modular concept offers the possibility to mount adjustable end switches for signalization. (except version **ExPlus -...-X**).

ExPlus -...-U is a 3-pos. actuator but additionally equipped with an analogue output 0...10 V / 4...20 mA. The **ExPlus -...-Y** must be controlled by 0...10 V / 4...20 mA incl. feedback 0..10 V / 4..20 mA.

Highlights

- ▶ For all type of gas, mixtures, vapours and dust for use in zone 1, 2, 21 and 22
- ▶ Universal supply unit from 24...240 VAC/DC
- ▶ Selectable forces 0,3/0,5 kN, 1,0/1,5 kN or 3,0 kN acc. to type
- ▶ Selectable motor running times 0,5 / 1,0 / 2,0 s/mm
- ▶ On-Off, 3-pos., 3-pos-U with 0...10 V / 4...20 mA feedback and control 0...10 V / 4...20 mA incl. feedback (Y-type)
- ▶ 0,3 – 0,5 – 1,0 – 1,5 – 3,0 kN actuator in only one housing size
- ▶ 100 % overload protected, self locking
- ▶ Compact design and small dimension
- ▶ Robust aluminium housing (optional marine painting Amercoat ...-CTS)
- ▶ IP66 protection
- ▶ Manual override included
- ▶ Only 3,5 kg (100 mm stroke) resp. 4 kg (300 mm stroke) weight
- ▶ Integral safety temperature sensor
- ▶ Status indication by LED



Technical data	ExPlus-3.5-... (basic type)	ExPlus-10.15-... (basic type)	ExPlus-30-... (basic type)
Force (nominal)	0,3 / 0,5 kN selectable	1,0 / 1,5 kN selectable	3,0 kN
Force (blockade) approx. (max.)	1,5 / 2,0 kN selectable	2,5 / 3,5 kN selectable	6,5 kN
Supply voltage/Frequency	24...240 VAC/DC +/- 10 %, 50...60 Hz +/- 20 %		
Power consumption	max. starting currents see table „EL“ (in acc. with voltage, I _{start} >> I _{rated})		
Heater consumption	approx. 16 W, (motor is not running in this moment)		
Stroke	100 or 300 mm acc. to type, shorter strokes on request		
Motorlaufzeiten	0,5 / 1 / 2 s/mm selectable		
Motor	Brushless DC Motor		
Control mode *	On-Off and 3-pos. or analogue 0-10 V / 4-20 mA signal (* acc. to type)		
Electrical connection	1 m cable extension, 0,5 mm ²		
Cable gland	M16 x 1,5 standard cable and wire entries are integral part of explosions proof encapsulation		
Manual override	Manual override only if supply voltage is cut, use delivered Allen key slow motion, enough torque/force is required		
Housing material	Aluminium die cast housing, painted (optional marine coating type ...-CTS)		
Dimensions	see drawing		
Weight	ca. 3,5 kg (100 mm stroke) resp. 4 kg (300 mm stroke) standard version without adaption		
Ambient temperature	-20...+40 °C at T6 / -20...+50 °C at T5		
Storage temperature	-40...+70 °C		
Humidity	0...90 % rH, non condensing		
Operation mode	S3/50 % ED = duty cycle (max. 300 operating cycles / h)		
Accuracy mechanically	approx. 5 mm stroke (hysteresis)		
Accuracy electrically	approx. 100 steps acc. to max stroke		
Parameter at delivery	300 N, 2 s/mm	1,0 kN, 2 s/mm	3,0 kN, 2 s/mm
Delivery	Actuator with 1 m cable extension, 1 linkage, Allen key for manual override, mounting bracket		
Wiring diagrams (SB)	SB 1.0	SB 1.0	SB 1.0

Deviate Data	ExPlus-3.5-...-X	ExPlus-10.15-...-X	ExPlus-30-...-X
Actuator ExPlus-...-X	as basic type, but without possibility to assemble external aux. switches		
Wiring diagrams (SB)	SB 1.0	SB 1.0	SB 1.0

Deviate Data	ExPlus-3.5-...-Y	ExPlus-10.15-...-Y	ExPlus-30-...-Y
Actuator ExPlus-...-Y	as basic type, but control 0-10 V / 4-20 mA (no 3 pos.)		
Feedback signal Y	0...10 VDC, 4...20 mA acc. on wiring selectable on site, U _u 0...10 VDC at 1.000...∞ Ω, U _i 4...20 mA at 0...800 Ω		
Wiring diagrams (SB)	SB 4.0	SB 4.0	SB 4.0

Deviate Data	ExPlus-3.5-...-U	ExPlus-10.15-...-U	ExPlus-30-...-U
Actuator ExPlus-...-U	as basic type, but incl. feedback signal U		
Feedback signal U	0...10 VDC, 4...20 mA acc. on wiring selectable on site, U _u 0...10 VDC at 1.000...∞ Ω, U _i 4...20 mA at 0...800 Ω		
Wiring diagrams (SB)	SB 5.0	SB 5.0	SB 5.0

Approvals	
Type examination	PTB 10 ATEX 1037X
Approval for gas	II2(1)G Ex d [ia] IIC T6/T5 Zone 1, 2
Approval for dust	II2(1)D Ex tD [iaD] A21 IP66 T80°C Zone 21, 22
CE-Mark	CE Nr. 0158
ATEX	94/9/EC
EMC	2004/108/EC
Low voltage	2006/95/EC
Protection class	I (grounded), overvoltage cat 2, pollution degree 2
IP-Protection	IP 66, in acc. with EN 60529

Accessories or special solutions	
...-CTS	Marine coating Amercoat, parts in stainless steel, cable gland nickel plated
ExSwitch	2 external aux. switches, adjustable, for zone 1, 2, 21, 22
ExBox-3P	Ex-e junction box for version -X and standard zone 1, 2, 21, 22
ExBox-Y/S	Ex-e junction box for version -U and -Y zone 1, 2, 21, 22
ExBox-SW	Ex-e junction box for aux switches ExSwitch zone 1, 2, 21, 22
MKK-S	Mounting bracket in VA for terminal boxes type ExBox-... direct on actuator
GMB-2	Rubber bellow 100 mm
GMB-3	Rubber bellow 300 mm
Adaptions	for fittings and manufacturer on request



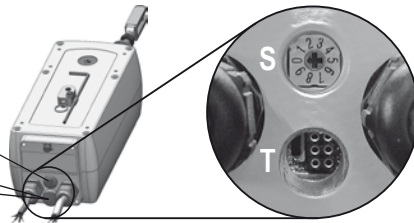
Electrical connection

All actuators are equipped with an universal supply unit working at a voltage from 24 to 240 VAC/DC. The supply unit is self adjustable to the connected voltage! Note current consumption acc. to motor running time and supply voltage (2 A inrush current). For permanently connected equipment is an external 2 A (time lag) circuit-breaker in the control cabinet required. This should be in close proximity to the equipment and within easy reach of the operator. It should be marked as the disconnecting device for the equipment. Approved fuse according IEC 60127-2 and/or UL 248-14 and min. breaking capacity 1500 A for AC and/or DC supply voltage should be used.

Parameter, Adjustment – Failure indication

Switch – Push button – Lamp for adjustment, behind the blanking plug

- 10-position switch (S)
- Push button(T)
- 3-colour LED



Parameter selection

Example:
ExPlus-10.15

Type	Forces	
ExPlus -3.5	300 N	500 N
ExPlus-10.15	1.000 N	1.500 N
ExPlus -30	3.000 N	3.000 N

Running times	Pos. of switch	
0,5 s/mm	00	05
1 s/mm	01	06
2 s/mm	02	07
2 s/mm	03	08
2 s/mm	04	09

Requested parameter:
Force 1000 N
stroke/s 2 s/mm

Result:
switch position (S) 02

Function, adjustment and parameter

A) Self adjustment:

Push button T for min. 3 seconds. The actuator will drive into both end positions to be adjusted. LED indicates green blinking. The adjustment drive could be applied in any switch position (S).

B) Selection of running time and force:

Put 10 position switch (S) into the correct/selected position in acc. to above table. The selected parameter will work at next operation of the actuator. Adjustment can be done even without supply voltage. If supply voltage is available turn switch only if actuator is not running.

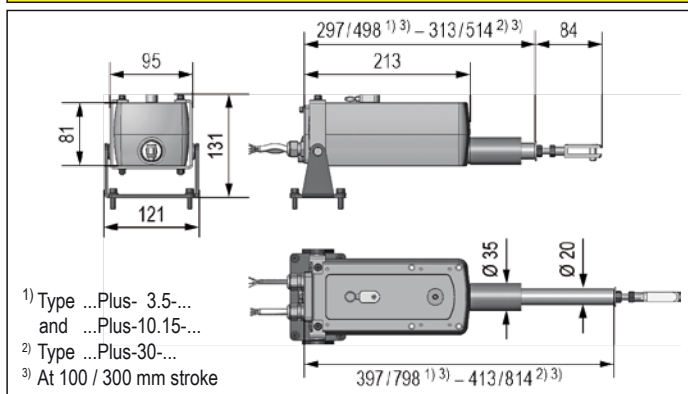
C) Additional information for 3-pos operation:

- a closed, b open = rod moves out
- b closed, a open = rod moves in
- a and b closed = Motor doesn't work, No function
- a and b opened = Motor doesn't work, No function

D) Force in blocking position:

The force in the end position could be much more than the nominal force. Generally the valve is to check together with actuator and construed accordingly.

Dimensions 100 mm and 300 mm stroke

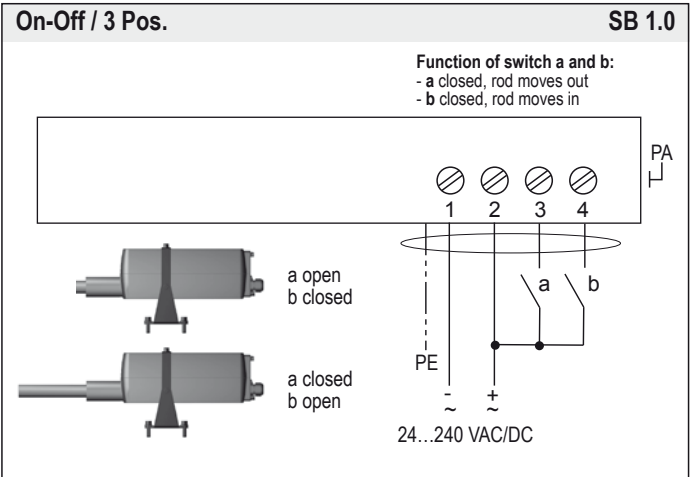


1) Type ...Plus- 3.5... and ...Plus-10.15...

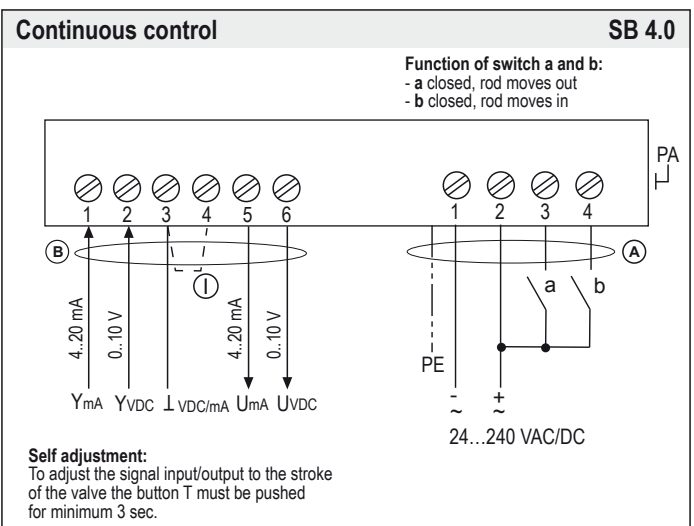
2) Type ...Plus-30...

3) At 100 / 300 mm stroke

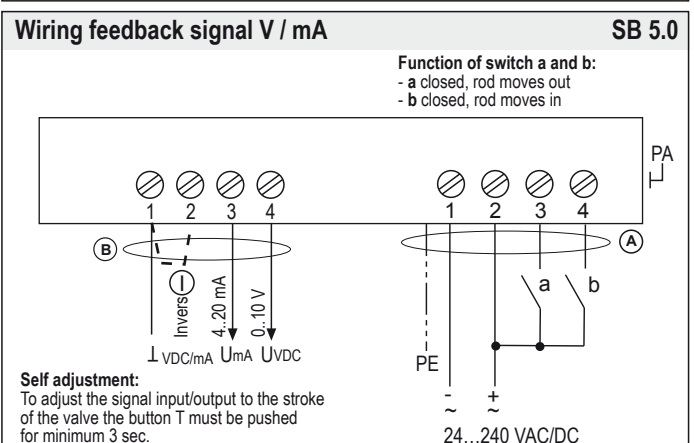
Wiring diagram ExPlus- / ExPlus-...-X



Wiring diagram ExPlus-...-Y



Wiring diagram ExPlus-...-U





Mounting instructions and important information for operation and installation

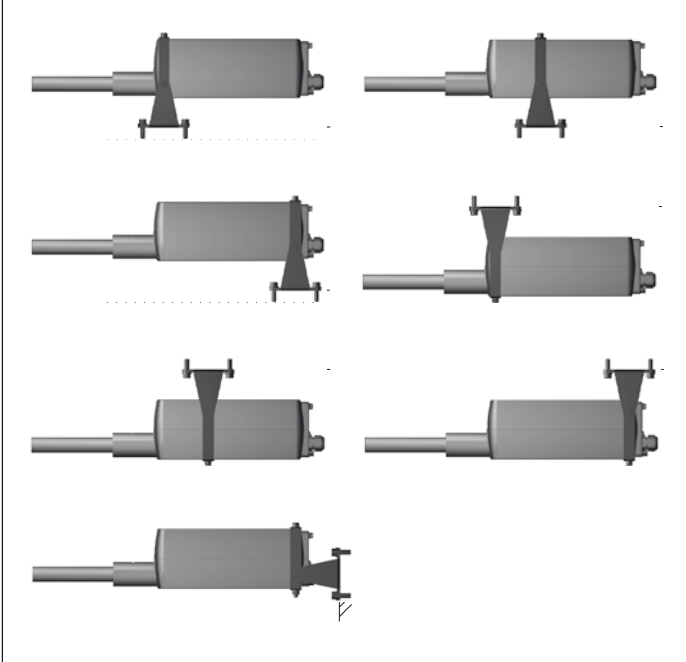
Safety notes Ex

hazardous locations
Zone 1, 2, 21, 22

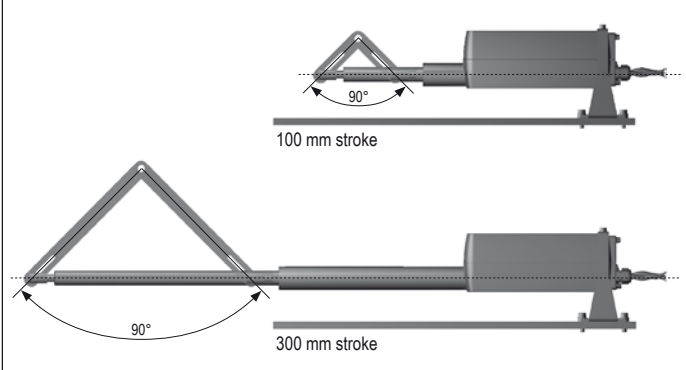
~~Ex~~ safe area

- Do not open the cover when circuit alive
- The cable must be installed in a fixed position and protected against mechanical damage
- Connect potential earth.
- Avoid temperature transfer from process to actuator (note max. ambient temperature !)
- Ambient temperature -20...+40 °C at T6 / -20...+ 50°C at T5
- Close all openings with min IP66
- Regard all regional standards, rules and regulations.
- Flameproof enclosure is protected against mechanical damages acc. to EN 60079-ff.
- For outdoor installation a protective housing against rain, snow and sun should be applied to the actuator, as well as a constant supply at terminal 1 and 2 for the integral heater.
- Use for wiring an explosion proof Ex-e terminal box
- Actuators are maintenance free, a function test per year is recommended
- Clean with wet cloth, avoid dust accumulation

Mounting variations



Stroke variations



Accessory ExBox – adaptable Ex-e terminal box

For electrical connection of an ExPlus inside the hazardous area an Ex-e terminal box is required.
ExBox-3P for ExPlus-..., ExPlus-...-X,
ExBox-Y/S for ExPlus-...-U and ExPlus-...-Y.
 To adapt the ExBox direct to the actuator housing an additional accessory **type MKK-S** is required.
 Cable gland M20 × 1,5 II2GD PA V0 certified. For cable diameter 6-13 mm. (more see ..Box data sheet)

Accessory ExSwitch – adaptable external Ex-d aux. switches

ExSwitch is an accessory to ExPlus actuators, fixing directly onto the actuator. ExSwitch are aux. switches with with 2 potential free contacts, adjustable on site. The electrical wiring needs an Ex-e terminal box ExBox-SW. Switches has approx 1 m cabl. (see ..Switch data sheet)

Manual Override

1. Actuator must be in stop position
2. Actuator must be switched off
3. Pull the ring to unlock „hand mode“
4. Turn with allen key and adjust the stroke
5. Push the shaft inside „motor mode“

Attention : during activated motor and manual adjustment can be occur malfunctions which leads to the destruction of the gear.

Force	Torque at stroke		
	100 mm	200 mm	300 mm
300 N	15 Nm	30 Nm	45 Nm
500 N	25 Nm	50 Nm	75 Nm
1000 N	50 Nm	100 Nm	150 Nm
1500 N	75 Nm	150 Nm	225 Nm
3000 N	150 Nm	300 Nm	450 Nm

Extra information „EL-P“ (see additional data sheet)

extra technical information, versions of circuit diagrams and failure indication