# BIBUS

EasyE-line

Linear in-line Actuator

| Gear ratio | C* | D | E | F | G | H |
|---|---|---|---|---|---|---|
| **easyE-35** | | | | | | 12/24VDC |
| **Force 24V (dyn. push and pull) [N]** | 120 | 400 | 600 | 900 | 1600 | 2200 |
| **Speed at maximum load [mm/s]** | 33 | 16 | 12 | 7,5 | 4 | 3 |
| **Force 12V (dyn. push and pull) [N]** | - | 400 | 600 | 900 | 1500 | 2000 |
| **Speed at maximum load [mm/s]** | - | 16 | 9 | 7,5 | 3,5 | 2,5 |
| Current at maximum load: **12VDC** (max 14 VDC) = 3,6A, **24VDC** (max 28 VDC) = 1,8A | | | | | | |
| **easyE-50** | | | | | | 12/24VDC |
| **Force 24V (dyn. push and pull) [N]** | 500 | 1750 | 2200 | 3100 | 4500 | 4500 |
| **Speed at maximum load [mm/s]** | 70 | 20 | 17 | 12 | 6 | 4 |
| **Force 12V (dyn. push and pull) [N]** | - | 1400 | 1700 | 2400 | 4500 | 4500 |
| **Speed at maximum load [mm/s]** | - | 14 | 10 | 6 | 3 | 3,5 |
| Current at maximum load: **12VDC** (max 14 VDC) = 16A (ratio C-F), 14A (G), 9A (H), **24VDC** (max 28VDC) = 8A (C-F), 7A (G), 4,5A (H) | | | | | | |
| **easyE-60** | | | | | | 24VDC |
| **Force 24V (dyn. push and pull) [N]** | | 1900 | 4300 | 6600 | 8100 | 10000 |
| **Speed at maximum load [mm/s]** | | 26 | 12 | 8 | 6 | 5 |
| Current at maximum load: 24VDC (max 28VDC) = 11,5A | | | | | | |

Max. load limited for stroke > 400mm:                                        *only 24V DC power supply
1000N (easyE-35), 2000N (easyE-50), 5000N (easyE-60)

## Features:

- Stroke length:       50, 100, 150, 200, 250, 300, 350, 400, 500 and 750mm (others on request)
- Cable:               easyE-35: 1m, 2X0.52mm² (AWG20), Ø = 4.8mm, black, Molex Mini-Fit Jr. 6 pin
                        easyE-50: 1m, 2X1.3mm² (AWG16), Ø=6.4mm, black, Molex Mini-Fit Jr. 6 pin
                        easyE-60: 1m, 2X1.3mm² (AWG16), Ø=6.4mm, black, Molex Mini-Fit Jr. 6 pin
- Bending radius:      6x cable diameter
- Materials:           Motor and actuator tube are powder coated steel or stainless steel
                        Piston rod is aluminum (easyE-35) or stainless steel (easyE-50 and easyE-60)
                        Front and rear brackets are PA, Aluminium or stainless steel
- Protection class:    IP66 (standard), harsh environment (according to IP68 and IP69)
- Max. static load/    easyE-35: PA brackets: 2000N Alu/AISI: 5400N
  Self locking force   easyE-50: PA brackets: 4700N Alu/AISI: 16800N
                        easyE-60: Alu/AISI: 18100N
                        Depending on stroke length for push-applications
- Temperature:         Operation: -20ºC to +70ºC (easyE-35 and easyE-50) -20°C to +50°C (easyE-60)
                        Storage: -40ºC to +70ºC
- Duty cycle:          Max. 10% or 2 minutes in use followed by 18 minutes rest

## Please Note:

- Never expose the actuator to hammer strike during installation or in other situations
- Retrofitted bushings should be pressed into the bracket-borings. No hammering
- Power supply without over-current protection can cause serious damage to the actuator at
  mechanical end-stop or when actuator is overloaded in another way
- Keep piston tube clean
- Longer cable lengths may cause voltage drop which affects the performance of the actuator
- For medical applications (IEC60601-1, ANSI/AAMI/ES60601-1, CAN/CSA-C22.2 No60601-1):
  Operating temperature +5ºC to +48ºC, Relative humidity 20% - 70% atmospheric pressure = 1atm.
  Connect to medically approved supply source only and according to guidelines provided with the source.
- Function of the actuator is subject to the settings of the control box. If using your own controller please contact us.
- The dust and water sealing of harsh environment actuators might affect their performance
- All specifications are for 25 ºC ambient – low temperature might affect performance
- Depending on load and application, nominal and actual stroke length may differ due to internal disc
  springs not being fully compressed.
- The combination of gearing and stroke can cause limitations in the use of „End limit FW" when using
  the S2-3 controller. See more in the datasheet for S2-3.

## Please note the important advices at www.bansbach.de/easyE-line
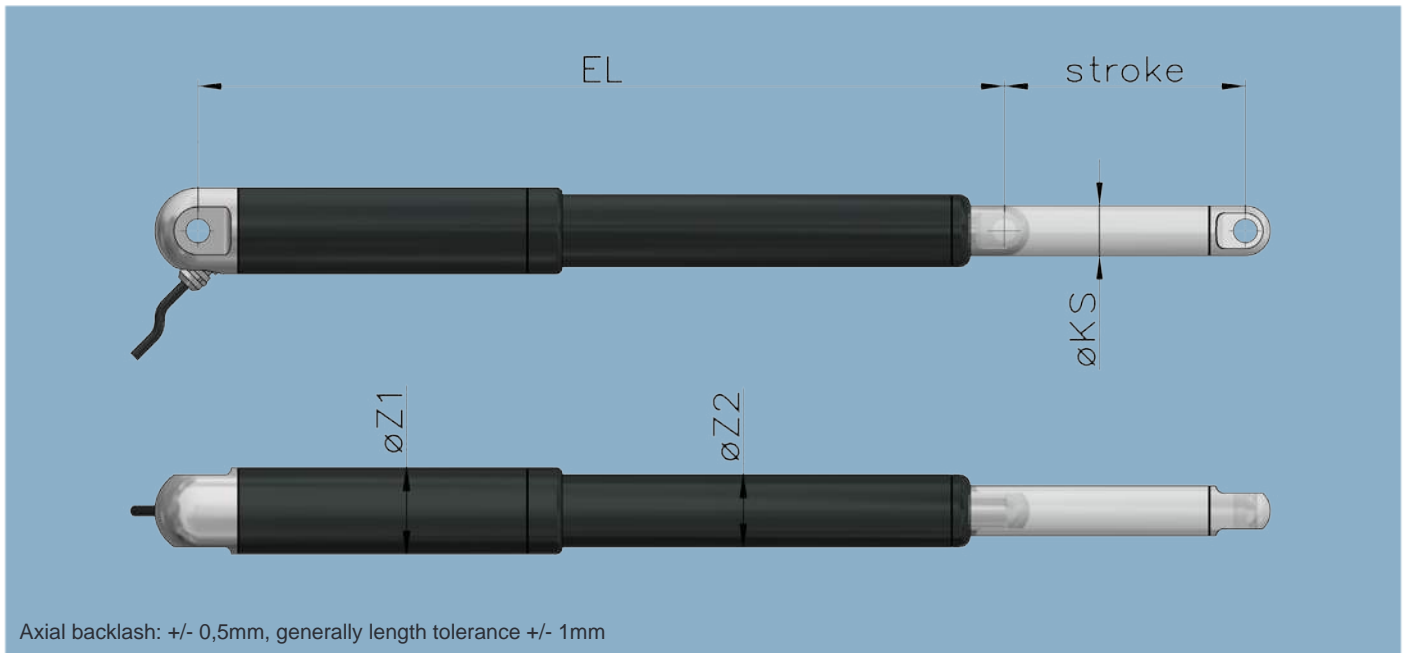
Axial backlash: +/- 0,5mm, generally length tolerance +/- 1mm

| | EL | Clevis rear | Hall | UL/ EN60.601 | harsh env. | Emergency lowering/spline | ØZ1 | ØZ2 | ØKS |
|---|---|---|---|---|---|---|---|---|---|
| **easyE-35** | | | | | | | | | |
| Gear ratio: C, D, E, F | stroke+160* | +10 | +10 | +10 | +11 | - | Ø35 | Ø28 | Ø20 |
| Gear ratio: G, H | stroke+170* | | | | | | | | |
| **easyE-50** | | | | | | | | | |
| Gear ratio: C, D, E, F | stroke+240** | - | +15 | +15 | +14 | +23 / +6 | Ø50 | Ø40 | Ø30 |
| Gear ratio: G, H | stroke+255** | | | | | | | | |
| **easyE-60** | | | | | | | | | |
| Gear ratio: all ratios | stroke+358*** | - | +15 | - | +25 | +31 / +10 | Ø60 | Ø50 | Ø35 |

*If stroke >400mm: EL+7mm, if stroke >700mm: EL+42mm
**If stroke >750mm: EL+100mm (on request)
***If stroke >400mm: EL+25mm (not Harsh-Environment-version)

## Recommended mounting methods:

■ Do not clamp actuators on tubing
■ Always keep both brackets mounted in the same orientation and ensure to flush mount actuator
■ Brackets must always be able to rotate on axis in mountings
■ Avoid radial forces at all times
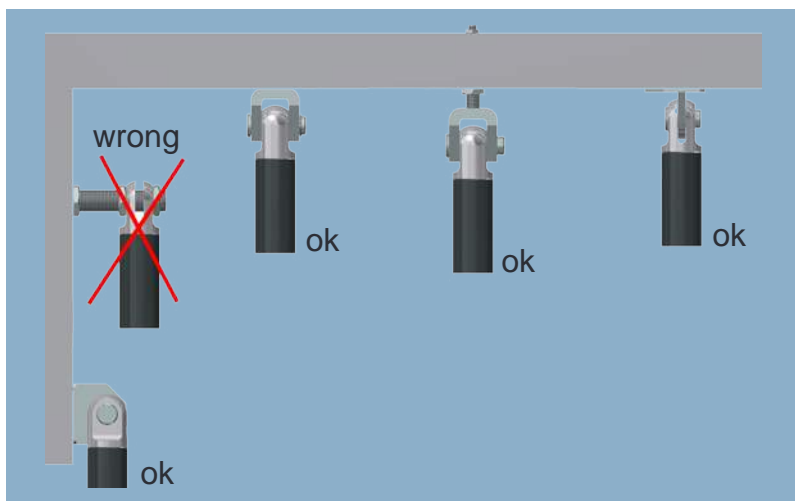
# Choose your actuator:

**1. Model:**
- ☐ *easyE*-35
- ☐ *easyE*-50
- ☐ *easyE*-60

**2. Stroke length:**
- ☐ 50, 100, 150, 200, 250, 300, 350, 400, 500 and 750mm (others on request)

**3. Gear ratio:**
- ☐ C, D, E, F, G, H (speed and load see table)

**4. Voltage:**
- ☐ 12V DC (only easyE-35 and easyE-50)
- ☐ 24V DC

**6. Cable length:**
- ☐ 1m - 9m (others on request)

**7. Connector:**
- ☐ no connector
- ☐ Molex minifit

**8. Material:**
- ☐ Standard steel
- ☐ AISI 316

**9. Protection class:**
- ☐ IP66 (standard)
- ☐ harsh environment (according to IP68 and IP69)

**10. Certification:**
- ☐ For medical applications:
  IEC60601-1, ANSI/AAMI/ES60601-1,
  CAN/CSA-22.2 No60601-1 (only 24 V DC)
  (Operation temperature: +5°C to +48°C)

**11. Hall sensor:**
- ☐ no (standard)
- ☐ yes (cable will change)

**12. Low noise:**
- ☐ no (standard)
- ☐ yes (not available in stainless steel)

**13. Color:**
- ☐ Black (standard)
  Available in all RAL colors
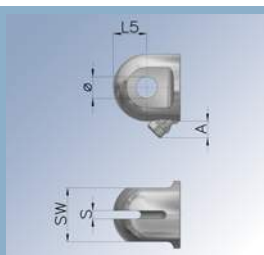
**14. Connecting parts**

# Connecting parts "motor side":

| Code | Ø | L5 | SW | A | Material | Max static load |
|------|-----|-----|-----|-----|----------|-----------------|
| *easyE-35* | (mm) | (mm) | (mm) | (mm) | | |
| A1M | $10^{+0,2}_{0}$ | 17,5 | 28 | 6 | Alu | 5400 N |
| B1M | $10^{+0,2}_{0}$ | 17,5 | 28 | - | Polyamid (PA) | 2000 N |
| C1M | $10^{+0,2}_{0}$ | 17,5 | 28 | 6 | stainless steel (316) | 5400 N |
| *easyE-50* | | | | | | |
| A2M | $16^{+0,2}_{0}$ | 25 | 40 | 12,3 | Alu | 16800 N |
| B2M | $16^{+0,2}_{0}$ | 25 | 40 | - | Polyamid (PA) | 4700 N |
| C2M | $16^{+0,2}_{0}$ | 25 | 40 | 12,3 | stainless steel (316) | 16800 N |
| *easyE-60* | | | | | | |
| A3M | $16^{+0,2}_{0}$ | 30 | 50 | 12,3 | Alu | 18100 N |
| C3M | $16^{+0,2}_{0}$ | 30 | 50 | 12,3 | stainless steel (316) | 18100 N |

*with spherical bearings*
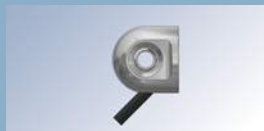
| Code | Ø | L5 | SW | A | Material | Max static load |
|------|-----|-----|-----|-----|----------|-----------------|
| *easyE-35* | (mm) | (mm) | (mm) | (mm) | | |
| E1M | $8^{0}_{-0,008}$ | 17,5 | 28 | - | Alu | 5400 N |
| *easyE-50* | | | | | | |
| E2M | $12^{0}_{-0,008}$ | 25 | 40 | - | Alu | 11000 N |
| *easyE-60* | | | | | | |
| E3M | $15^{0}_{-0,008}$ | 30 | 50 | 12 | Alu | 11000 N |
| J3M | $15^{0}_{-0,008}$ | 30 | 50 | 12 | stainless steel (316) | 11000 N |

| Code | Ø | L5 | SW | A | S | Material | Max static load |
|------|-----|-----|-----|-----|-----|----------|-----------------|
| *easyE-35* | (mm) | (mm) | (mm) | (mm) | (mm) | | |
| F1M | $10^{+0,2}_{0}$ | 17,5 | 28 | 6 | 6,2 | Alu | 5400 N |
| G1M | $10^{+0,2}_{0}$ | 17,5 | 28 | - | 4,2 | Polyamid (PA) | 2000 N |
| H1M | $10^{+0,2}_{0}$ | 17,5 | 28 | 6 | 6,2 | stainless steel (316) | 5400 N |
| *easyE-50* | | | | | | | |
| F2M | $16^{+0,2}_{0}$ | 25 | 40 | 12,3 | 6,2 | Alu | 16800 N |
| G2M | $16^{+0,2}_{0}$ | 25 | 40 | - | 6,2 | Polyamid (PA) | 4700 N |
| H2M | $16^{+0,2}_{0}$ | 25 | 40 | 12,3 | 6,2 | stainless steel(316) | 16800 N |
| *easyE-60* | | | | | | | |
| F3M | $16^{+0,2}_{0}$ | 30 | 50 | 14 | 8,2 | Alu | 18100 N |
| H3M | $16^{+0,2}_{0}$ | 30 | 50 | 14 | 8,2 | stainless steel(316) | 18100 N |

PA-connecting parts are not available for gear ratio G and H
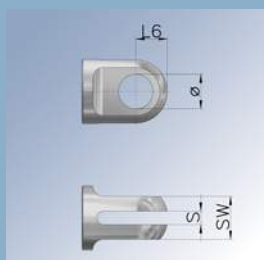
# Connecting parts "piston rod side":
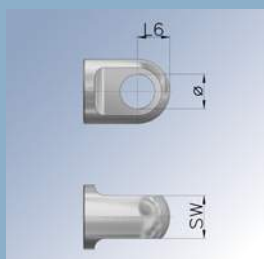
| Code | Ø | L6 | SW | Material | Max static load |
|------|-----|-----|-----|----------|-----------------|
| *easyE-35* | (mm) | (mm) | (mm) | | |
| A1K | $10^{+0,2}_{0}$ | 10 | 13 | Alu | 5400 N |
| B1K | $10^{+0,2}_{0}$ | 10 | 13 | Polyamid (PA) | 2000 N |
| C1K | $10^{+0,2}_{0}$ | 10 | 13 | stainless steel (316) | 5400 N |
| *easyE-50* | | | | | |
| A2K | $16^{+0,2}_{0}$ | 15 | 20 | Alu | 16800 N |
| B2K | $16^{+0,2}_{0}$ | 15 | 20 | Polyamid (PA) | 4700 N |
| C2K | $16^{+0,2}_{0}$ | 15 | 20 | stainless steel (316) | 16800 N |
| *easyE-60* | | | | | |
| A3K | $16^{+0,2}_{0}$ | 17,5 | 25 | Alu | 18100 N |
| C3K | $16^{+0,2}_{0}$ | 17,5 | 25 | stainless steel (316) | 18100 N |

*with spherical bearings*

| Code | Ø | L6 | SW | Material | Max static load |
|------|-----|-----|-----|----------|-----------------|
| *easyE-35* | (mm) | (mm) | (mm) | | |
| E1K | $8^{0}_{-0,008}$ | 12 | 18 | Alu | 5400 N |
| *easyE-50* | | | | | |
| E2K | $12^{0}_{-0,008}$ | 15 | 20 | Alu | 11000 N |
| *easyE-60* | | | | | |
| E3K | $15^{0}_{-0,008}$ | 20 | 28 | Alu | 11000 N |
| J3K | $15^{0}_{-0,008}$ | 20 | 28 | stainless steel (316) | 11000 N |

| Code | Ø | L6 | SW | S | Material | Max static load |
|------|-----|-----|-----|-----|----------|-----------------|
| *easyE-35* | (mm) | (mm) | (mm) | (mm) | | |
| F1K | $10^{+0,2}_{0}$ | 10 | 15 | 6,2 | Alu | 5400 N |
| G1K | $10^{+0,2}_{0}$ | 10 | 13 | 4,2 | Polyamid (PA) | 2000 N |
| H1K | $10^{+0,2}_{0}$ | 10 | 15 | 6,2 | stainless steel (316) | 5400 N |
| *easyE-50* | | | | | | |
| F2K | $16^{+0,2}_{0}$ | 15 | 20 | 6,2 | Alu | 16800 N |
| G2K | $16^{+0,2}_{0}$ | 15 | 20 | 6,2 | Polyamid (PA) | 4700 N |
| H2K | $16^{+0,2}_{0}$ | 15 | 20 | 6,2 | stainless steel (316) | 16800 N |
| *easyE-60* | | | | | | |
| F3K | $16^{+0,2}_{0}$ | 17 | 25 | 8,2 | Alu | 18100 N |
| H3K | $16^{+0,2}_{0}$ | 17 | 25 | 8,2 | stainless steel (316) | 18100 N |

PPA-connecting parts are not available for gear ratio G and H

# Controllers:

### *EEL-S1*
For 1-3 actuators

**FEATURES:**
- Plug and play solution
- Handset or external switches
- for easyE-35 and easyE-50

**TECHNICAL DETAILS:**
- Supply: 230V
- Output voltage: 24V

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### *EEL-S2-1*
For 1 actuator

**FEATURES:**
- Adjustable start and stop ramp
- Adjustable current limit
- Continuous-mode, impulse-mode
- Easy interfacing to PLC etc.
- DIN-rail fittable
- Hall sensors not supported

**TECHNICAL DETAILS:**
- Supply: 10 to 35VDC
- Output voltage = supply voltage
- Over voltage protection: 40 V
- Idle current: Approx. 15 mA
- Driving current: 10 A continuous,
  16 A with duty cycle 50%,
  Max 16 A on duty 2 min

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### *EEL-S2-2*
For 1 actuator

**FEATURES:**
- Precise position control from
  analog voltage input
- Adjustable start and stop ramp
- Settable current limit
- High momentary load capacity
- DIN-rail base fittable
- "Position reached" - signal
- Hall sensors necessary

**TECHNICAL DETAILS:**
- Supply: 10 to 35VDC
- Output voltage = supply voltage
- Actuator current continuous max: 15A
- Current limit adj.: 0.1-20A
- Overheat limit: 100°C
- Hall input freq.: Max 1kHz
- Input control logic (pos.): High=4-30V,
  Low=0-1V or open

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### *EEL-S2-3*
For 2 actuators

**FEATURES:**
- Synchronized operation of
  2 actuators
- Current and temperature protection
- Settable drive speed
- Adjustable start- and stop ramp
- Easy setting with serial interface
- Autobalance feature
- Hall sensors necessary

**TECHNICAL DETAILS:**
- Supply: 10 to 35VDC
- Output voltage = supply voltage
- Quiescent current: 15mA
- Motor current: 2x10A cont. 2x20A, 25% duty
- Current limit: 1-20A
- Pulse input freq. max.: 1kHz
- Pulse inputs pull- up/down: 10kO
- Control inputs: 0-1V=OFF; 4-30V=ON

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### *EEL-S3*
### *EEL-S4*
For 1-4 actuators

**FEATURES:**
- Battery powered for mobile use
- 24VDC NiMh or Li-Ion battery
- Customized colors and foil design
- Wired handset

**EEL-S3:**
- 1 actuator
- up- and down function

**EEL-S4:**
- Adjustable current limit in and out
- Adjustable calibration speed and current
- Adjustable virtual min/max-position
- Individual or synchronous operation for drive 1-4 actuators

**TECHNICAL DETAILS:**
- Supply: 24VDC NiMH or Li-Ion battery
- Output voltage: 24V
- Idle current: < 5mA
- Current limit: 8A/ch max. total 12A
- Ramps 0-3 sec
- Connector type Molex Mini-Fit 6 pin

The flyer is subject to technical alterations and printing mistakes.

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# easyE-i
## the intelligent actuator

**Bansbach easylift**

# The new „intelligent" in-line Actuator

In-line actuators with integrated controller (easyE-i) enable the use of MODBUS RTU on an RS485 serial communication. One of the most powerful standards. The easyE-i options provide everything from simple maintenance, control and installation, to a wide range of customizable settings and feedback that will help tailor the movement solution to your specific needs and application.

## Integrated controller functions:

- Adjustable start / stop ramp
- Adjustable current limit
- Internal temperature protection
- Industrial interface MODBUS RTU on RS485

- Internal stroke limitation
- Plug & Play solution with i-Connect-Box / i-Connect-Box DIN

## Specifications:

- Temperature: Operation: - 20 °C to + 70 °C; Storage: - 40 °C to + 70 °C
- Cable specification: Ø 4,8mm cable for easyE-35i (2 x AWG22 + 6 x AWG28), also available for Harsh Environment version
  Ø 6,8mm cable for easyE-50i/60i (2x AWG16 + 6 x AWG26), also available for Harsh Environment version, easyE-35i on request
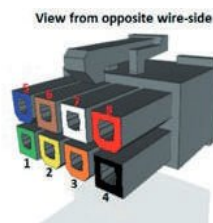- Bending Radius: 6 x cable diameter

Cable length for easyE-i-line with 12 VDC motor is limited to 5m, 24 VDC motor is limited to 9m.
The IP classification covers the actuator including cable and cable gland. Connector (if mounted) or open ends are not part of the certification.
For other mechanical data like forces, speed and so on please refer to standard easyE-35/50/60 datasheet.

## Configurations:

| Configurations | SDB (S2-1) Single Actuator Direction Control Basic IO | SDH (S2-1+hall) Single Actuator Direction Control Hall Output | SDP (S2-1+pos.out) Single Actuator Direction Control Position Output | SPP (S2-2) Single Actuator Position Control Position Output | SBS (bus based) Single Actuator BUS Control Status / Control IO | MDO (synchronization) Multiple Actuators Direction Control Override |
|---|---|---|---|---|---|---|
| Configuration letter | A | B | C | D | E | F |
| Voltage 12/24 VDC | | | | | | |
| Direction in/out | | | | - | - | |
| 5/10 VDC ref. output | - | - | - | | - | - |
| Stop input | - | - | - | - | | - |
| Override input | - | - | - | - | - | |
| Error output | - | - | - | - | | - |
| Analog position input | - | - | - | | - | - |
| Analog position output | - | - | | - | - | - |
| Stop input / Pos. OK output | - | - | - | | - | - |
| Hall Output | - | | - | - | - | - |

# Electrical Wiring:



View from opposite wire-side

| Configurations | SDB | SDH | SDP | SPP | SBS | MDO |
|---|---|---|---|---|---|---|
| Key letter | A | B | C | D | E | F |
| Color | | | | | | |
| Yellow (2) | RS485 TX +A | RS485 TX +A | RS485 TX +A | RS485 TX +A | RS485 TX +A | RS485 TX +A |
| Green (1) | RS485 RX -B | RS485 RX -B | RS485 RX -B | RS485 RX -B | RS485 RX -B | RS485 RX -B |
| Orange (3) | GND Signal | Hall B output | GND Signal | GND Signal | GND Signal | GND Signal |
| Black (4) | GND Power | GND Power | GND Power | GND Power | GND Power | GND Power |
| White (7) | Not used | Hall A output | Position output | 5-10V reference | Not used | Override |
| Brown (6) | Dir. IN | Dir. IN | Dir. IN | Pos ok/stop | Error out | Dir. IN |
| Blue (5) | Dir. OUT | Dir. OUT | Dir. OUT | input | Stop input | Dir. OUT |
| Red (8) | Power | Power | Power 12/24V | Position input | Power | Power |
| | 12/24V | 12/24V | | Power 12/24V | 12/24V | 12/24V |

Numbers refers to the 8-pin Molex minifit plug, not screw terminal on i-Connect-Box DIN

# Electrical Data

- **Max. Current load:**

  easyE-**35i:**  **24 VDC** permanent magnet motor  *(max. current: 1.8 A, max. voltage: 28 VDC)*
  **12 VDC** permanent magnet motor  *(max. current: 3.6 A, max. voltage: 14 VDC)*

  easyE-**50i:**  **24 VDC**  permanent magnet motor  *(max. current for ratio C-D-E-F: 8 A, ratio G: 7 A, ratio H: 4,5 A, max. voltage: 28 VDC)*

  **12 VDC** permanent magnet motor  *(max. current for ratio C-D-E-F: 16 A, ratio G: 14 A, ratio H: 9 A, max. voltage: 14 VDC)*

  easyE-**60i:**  **24 VDC** permanent magnet motor  *(max. current: 11,5 A, max. voltage: 28 VDC)*

- **Idle current:**  Approx. 25 mADC
- **Current trip delay:**  20 ms
- **PWM frequency:**  25 kHz
- **Digital inputs:**  Active low
- **Supply voltage:**  12 VDC (min. 12 VDC @ full load, max. 14 VDC) or
  24 VDC (min. 24 VDC @ full load, max. 28 VDC) (max. ripple <10% @ full load)
- **Serial data line:**  RS485 asynchronous, point to point or multi-point, 2 wire half-duplex
- **Communication:**  Modbus RTU
- **Baud rate:**  115200 bps
- **Com setup:**  8 Bit, Parity-None, Stop bit -1

# Recommendations and warnings

- Always connect easyE-i-line to a power supply that matches the nominal voltage of the actuator, also during update and parameter setting.
- Most switches are active low and to be pulled down to GND (Signal GND) for activation.

# Disclaimer