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Synchronising Control SYN 22 a

Installation and Operation Instructions - Version 1/21

Read these instructions carefully and completely.
Work may be performed only by qualified personnel!
Before starting any work, it is mandatory to deflect static charge.
We do not assume any guarantee or liability for defects caused by faulty connection.

1 Intended use, Concept

- Control for synchronising the travelling speed of two identical 24 V- actuators with an input current of 6 - 8 A of the series **G**, **SG, SG1Bx** or **SG1Cx** on a Vent or Smoke and Heat Vent (SHV). Not suitable for actuator types G201, G205, G209, G401, G405, G409.
- Both actuators are de-energised if any of them should fail.
- For actuators G and SG the input voltage is 24 V⎓, for actuators SG1Bx or SG1Cx it can be between 24 V⎓ and 48 V⎓.
- Power supply and control are provided by one or two actuator outputs of a SHEVS Control Centre or a ventilation control. The use of K + G / Grasl Control Centres is recommended. Compatibility is to be checked for third-party controls. Not to be operated with the Control RWD 1-16a.
- The travel direction of the actuators must not be switched by directly reversing the polarity of the input voltage.
- Selectable functions:
  - "Actuator SG1Bx or SG1Cx" (must be activated for these actuators)
  - "8 A actuator SG1Bx or SG1Cx" (must be activated for these actuators)
  - "Power control for actuator SG1Bx or SG1Cx" (can be activated for these actuators)
  - “Synchronisation OFF” (there is no synchronisation of the travelling speed of the actuators, but both actuators are switched off if one of them fails)
- Internal indicators △ 1 / △ 2 and ▽ 1 / ▽ 2
- Plastic enclosure, light grey (like RAL 7035)

2 Installation / Putting into and out of service / Notes

Perform work only in de-energised condition.

*The **SYN** must not be directly controlled (e.g. with external accumulators during installation / maintenance) if it is already connected to a SHEVS Control Centre / Control. This can lead to defects in the power output of the of the SHEVS Control Centre / Control.*
*Actuators must not be actuated directly if they are already connected. This can lead to defects in the power output of the **SYN**.*

- For installation of the SYN, put the Control Centre / Control out of service following the instructions given in the belonging Operation Instructions.
- Fasten the enclosure securely using suitable mounting material. Pass the connection cables through the openings provided and wire them according to the enclosed connection diagrams.
- Set up the selectable functions (see section 3), close enclosure.
- Put the Control Centre / Control into service again.
  *The **SYN** only works when travel commands are active.*
- The **SYN** only works when travel commands are active on both inputs.
- The indicator △ 1 / △ 2 or ▽ 1 / ▽ 2
  - lights up: travel command is active.
  - flashes (50 ms on): travel command is blocked (change of travel direction is required) or incorrect input voltage.
  - blinks: the actuators have reached their end position, there is a wire breakage or an overload cut-off has responded.
  - flickers: the actuators have been switched off due to exceeding the range of regulation.
  - flashes (50 ms off, only for actuator SG1Bx or SG1Cx): overload cut-off has responded.

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*After an automatic switch-off by the **SYN**, it is only possible to drive in the same direction again if it has been driven in the other direction in the meantime.*

The regulation also works with asymmetrical loads up to a load ratio of about 70:30.

During operation, minor stroke differences may occur which are compensated by the follow-up movement at the time of closing. If the actuators go through the entire stroke without interruption, the synchronisation deviation amounts to max. 0.5 % of the total stroke.

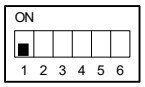
In case of repeated start operations in the same travelling direction, synchronization deviations can add up.

*When the Control Centre / Control is put out of service, the **SYN** is out of service as well.*

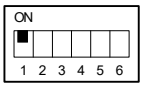
3 Selectable functions

The following functions can be selected via DIP switches (* = factory setting):

- **"Actuator SG1Bx or SG1Cx"** DIP switch **1**:
  For actuators SG1Bx or SG1Cx, this switch must be set to ON.

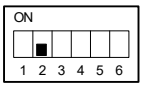


Actuator type **G**, **SG** *

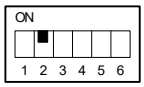


Actuator type **SG1Bx** or **SG1Cx**

- **"8 A actuator SG1Bx or SG1Cx"** DIP switch **2**:
  For actuators SG1Bx or SG1Cx with a current input of 8 A, this switch must be set to ON.

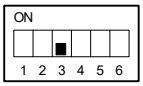


Overload cut-off **6 A** *

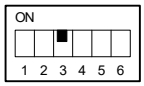


Overload cut-off **8 A**

- **"Power control for actuator SG1Bx or SG1Cx"** DIP switch **3**:
  In position ON, the power control is activated. It controls the force-speed-ratio of the actuator. The speed of the actuator is reduced and the thrust force is increased.
  Consider the total travelling time of the actuator!



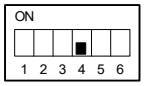
Normal operation *



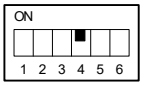
Power control activated

  Consider the following for active power control: Before the Smoke and Heat Vent is operated with maximum load (base load plus snow load), one travelling cycle with base load must be run for reference!

- **"Synchronisation off"** DIP switch **4**:
  In position ON there is no synchronisation of the travelling speed of the actuators, but both actuators are switched off if one of them fails.



Synchronisation on *



Synchronisation off

- DIP switches **5** and **6**: Do not change setting. Factory setting: OFF.

4 Technical Data

SYN 22a-16 (8164 2211 6000)

Voltage supply (inversion of polarity for ⍙ / ⍛)	24 V⎓ (-5.0 V / +6 V)
Voltage supply for actuators SG1Bx or SG1Cx	24 V⎓ to 48 V⎓ (-6.0 V / +4.8 V)
− Permissible ripple	150 mVpp
− Required pause when changing the travel direction	≥ 1 s
Inrush current	ca. 6 A / 10 µs
The inrush current of the actuators must also be observed.	
Overrun time when retracting the actuators	0.5 s
Nominal current input	2 x 8 A / 24 V⎓ or 2 x 4 A / 48 V⎓
Input in case of emergency cut-off	Nominal current +30 %
Maximum actuator current	2 x 8 A / 24 V⎓
Dimensions in mm (W x H x D)	250 x 200 x 100
Mounting dimensions in mm	200 x 150
Cable entry from all sides through stepped nipples (Ø 35 mm)	per 3 pieces
Environmental Class I (VdS 2581)	-5 °C … +75 °C
Max. permanent ambient temperature	+60 °C
Relative humidity	20 % … 80 %, non-condensing
Enclosure protection rating	IP43
Maximum cable cross-section	4 x 10 mm² (rigid) per input 2 x 2.5 mm² (rigid) per output
Permissible cable length from the **SYN** to the actuators	< 3 m

Permissible cable length from the Control Centre to the **SYN** with 1 V voltage drop (simple and moderately branched arrangement). Depending on the minimum input voltage and the operating voltage of the actuators, a higher voltage drop may be permissible.

Current / Cross-section	24 V			
	6.0 A	8.0 A	12.0 A	16.0 A
2 x 1.5 mm²	7 m	5 m	4 m	3 m
2 x 2.5 mm²	12 m	9 m	6 m	5 m
2 x 4.0 mm²	19 m	15 m	10 m	7 m
2 x 6.0 mm²	29 m	22 m	15 m	11 m
2 x 10.0 mm²	48 m	36 m	24 m	18 m
4 x 1.5 mm²	15 m	11 m	7 m	5 m
4 x 2.5 mm²	24 m	18 m	12 m	9 m
4 x 4.0 mm²	39 m	29 m	19 m	15 m
4 x 6.0 mm²	58 m	44 m	29 m	22 m
4 x 10.0 mm²	97 m	73 m	48 m	36 m

When 4 cores are used, connect 2 cores each in parallel.

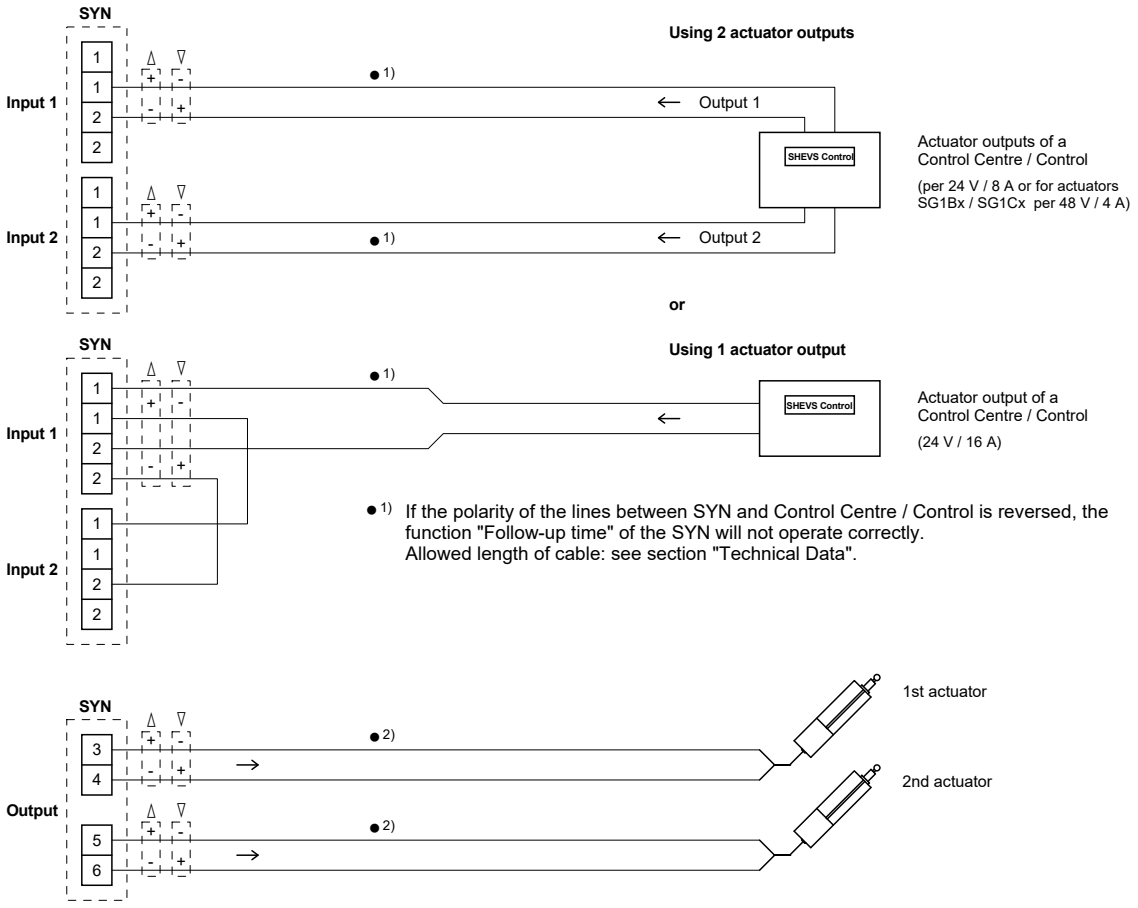
Permissible cable length from the Control Centre to the **SYN** for actuators SG1Bx or SG1Cx.

Current / Cross-section	24 V				48 V	
	6.0 A	8.0 A	12.0 A	16.0 A	3.0 A	4.0 A
2 x 1.5 mm²	15 m	11 m	7 m	5 m	58 m	44 m
2 x 2.5 mm²	24 m	18 m	12 m	9 m	97 m	73 m
2 x 4.0 mm²	39 m	29 m	19 m	15 m	155 m	116 m
2 x 6.0 mm²	58 m	44 m	29 m	22 m	232 m	174 m
2 x 10.0 mm²	97 m	73 m	48 m	36 m	387 m	290 m
4 x 1.5 mm²	29 m	22 m	15 m	11 m	116 m	87 m
4 x 2.5 mm²	48 m	36 m	24 m	18 m	193 m	145 m
4 x 4.0 mm²	77 m	58 m	39 m	29 m	309 m	232 m
4 x 6.0 mm²	116 m	87 m	58 m	44 m	464 m	348 m
4 x 10.0 mm²	193 m	145 m	97 m	73 m	773 m	580 m

When 4 cores are used, connect 2 cores each in parallel.

The requirements of Directives 2014/35/EU and 2014/30/EU are met. CE

5 Terminal diagram, layout diagram



● 1) If the polarity of the lines between SYN and Control Centre / Control is reversed, the function "Follow-up time" of the SYN will not operate correctly.
Allowed length of cable: see section "Technical Data".

● 2) In the case of wrong travelling sense, the polarity of the actuator supply lines may only be reversed if proper connection of the line between SYN and Control Centre / Control has been verified.
Allowed length of cable: < 3 m.